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Organization and Administration of a Continuation School

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COMPULSORY continuation schools are the direct result of a concerted attempt in education to make employed minors efficient producers, economical consumers and contented members of society. They are training children to ultimately take their places as industrial and civic units in our scheme of social society. They are offering to all employed children equal educational opportunity to improve their status in the industrial, commercial and agricultural world; and to eliminate the economic waste caused thru non-production of unemployables whose vocational adaptability has never been determined. Society, economically dependent upon production and socially dependent, upon intelligent citizenship, must benefit thru the operation of the part-time school.

Children to Receive Instruction.

The number of children who continue at school beyond the completion of the sixth grade which is a requirement previous to the granting of an employment certificate, and the number of children who leave school and enter employment are equal. Investigation has proven conclusively that 41 per cent of the children attending the Boston Continuation School, have left school and obtained employment because of economic necessity, 24 per cent because they cannot carry on the work of the regular schools, and 35 per cent because the idealistic work of the regular schools does not appeal to their practical minds. This last group are desirous of going to work; they are adaptable to concrete rather than abstract instruction and are impatient to enter employment.

Reasons for Leaving School.

Statistics compiled from accurate investigations of 5,425 children attending the Boston Continuation School October, 1920, show the following causes of elimination:

Economic necessity	41%	Boys	47%	Girls
Wanted to go to work	18%	Boys	14%	Girls
Disliked regular school	27%	Boys	16%	Girls
Slow progress in school	11%	Boys	6%	Girls
Graduation from elementary schools	2%	Boys	8%	Girls
Illness	1%	Boys	9%	Girls

Facts Concerning the Amount of Education Received by These Children.

Twenty per cent are high school pupils—mostly those who made failures in academic work, and seldom forced out by poverty. Most of them are lacking in fundamentals, so they fail to keep up in their studies. Forty per cent are elementary school graduates. These children are almost in toto capable and well trained and should be given a high school education. Forty per cent are children from the sixth, seventh and eighth grades. A large percentage of these pupils are children of foreigners from non-English speaking homes, the whole atmosphere of which tends to get the child to work early in life. Their slow progress in school is largely due to the fact that it is difficult for them to think quickly in the English language. The remainder are either motor minded children to whom abstract instruction does not appeal or pupils abnormal or subnormal in mental equipment.

Children in Continuation School.

The children attending the continuation school may be classified as follows:

1. Those fitted for a particular kind of work, and those who have no apparent vocational ability.
2. The child with considerable ability for academic work and little for manual work.
3. The child with unusual manual skill and normal academic ability.
4. The abnormal child who possesses very little ability either mentally or manually.
5. The motor-minded child, who is lacking in academic skill, and is a genius on manual work.
6. The normal child who has equal manual and academic skill.

It is patent that the instruction given in the continuation school must be determined entirely by the scholastic equipment and the future objective of the pupils who are required by law to attend this unique type of school. Sixty per cent of the children are elementary school graduates, and therefore the major problem is one of producing suitable instruction for graduates of elementary school, four hours per week, 40 weeks per year in the interim between their four-

teenth and sixteenth birthdays. Each employed minor who attends is anticipating his future place in industrial and civic society, and is seeking to ameliorate his working conditions and to progress in the business world. Subjects designed primarily to increase the individual child's civic and vocational intelligence must be taught in the continuation school. The content of the courses of study should be determined essentially with this basal objective in view. The method of instruction is dependent largely upon manners of presentation and class procedure peculiar to the period of adolescence with its pronounced physiological and psychological effect. The salient characteristics of the adolescent which are particularly pronounced in Continuation School instruction and which bear direct relation to the work are: insistence on personal rights, gang spirit, independence, analysis, wanting to know the reason why of things, intense restlessness and insistence on receiving "a square deal." Interest and apperception are admittedly the two leading psychological factors and can be utilized very effectively in instruction.

Manner of Enrollment.

Any child between the ages of fourteen and sixteen who elects to leave regular graded elementary or high school and procure employment may do so provided he fulfills certain requirements. In order to obtain an employment certificate a child under sixteen years of age must obtain: First, a birth certificate as evidence that he is at least 14 years of age; Second, a record from the last school attended attesting to his completion of the sixth grade, and that he has attended the regular day schools at least 130 days since his thirteenth birthday; and Third, a promise of employment card signed by his prospective employer. Having fulfilled these three essential conditions prior to the granting of an employment certificate, the child must present himself for physical examination to determine his fitness to perform the duties of his elected employment. If the applicant passes the doctor's examination successfully, he is given an employment certificate for his future employer at the Boston Certificating Office. The minor then proceeds to the continuation school, is enrolled, assigned to attend on a stipulated day and hour, and advised as to the location of the class. The employment certificate is then carried by the child to his future employer who employs the child "under the authority of an employment certificate" and subject to the provisions governing such employment.

Internal Organization and Administration.

The functions of the continuation school have been long since specified and defined. They include (1) Training for future citizenship; (2) A review of the child's previous education with the purpose of emphasizing its importance; (3) The establishment of an efficient employment bureau to eliminate time wasted thru unemployment, and place vocationally those fitted for particular employments; (4) Vocational guidance and follow-up work; (5) Linking up school work with the child's job wherever possible, thereby giving strictly trade preparatory and trade extension training; (6) The introduction of prevocational activity as a means to discover the child's vocational aptitude thru a series of prevocational experiences.

These prevocational activities determine what the individual is fitted for or what is equally important for what he is not fitted. The negative of the conclusion becomes a positive asset which aids the child in the future selection of his work. The instruction to be pursued in any continuation school naturally is divided into, first, civic instruction, and second, vocational instruction. The civic instruction given in all continuation schools is constant, since the rights, duties and obligations of citizenship are universally the same. On the other hand, the vocational education given in a continuation school must be based on the needs of the local community and the wants peculiar to the dominating industries and commercial activities of the city where the school is situated. It is obvious that the problems of the east in vocational part-time instruction are not essentially the problems of the west or the problems of the middle west.

In addition to instruction in industrial and commercial occupations, the large ports of entry in the east, New York, Boston, etc., have analogous problems; namely, the serving of groups who are determined by the economic factors which have caused not only the cosmopolitan population of these cities, but also the numerical population, and the type of work which the people are engaged in. These cities are large manufacturing, commercial and distributing centers and also ports of entry where immigrants first arrive and the tendency is to remain. These immigrants demonstrate very markedly their own racial characteristics and tendencies. In spite of the Americanization campaigns which are attempting to obviate the bane of the present herding according to nationality, these immigrants insist on living as nations and classes within a nation. Their homes for the most part constitute the slum districts of these cities where long rows of dingy tenements appear to be their perpetual abode. This reduces the level of American living conditions to a squalid plane and creates a very poor environment for the future education of their offspring. Their children then are handicapped from birth by difficulty to think clearly and quickly in the English language, being as they are products of non-English speaking parents. In their homes conversations are constantly held in their native tongue and foreign newspapers are read, reeking as they are with radical theories. These children handicapped both by birth, environment and previous education, at the age of fourteen years are automatically forced out of school and compelled to go to work to help support their parents. This group constitutes a considerable percentage of any continuation school inaugurated in the large eastern cities of the United States. Forced out of school as these children are, and

compelled to earn a livelihood by the cruel mandate of poverty which has determined to a great extent their future career, they find themselves in free America, which boasts of equality of opportunity, facing handicaps which can only be overcome thru efficient instruction in part-time schools.

With these essential functions of the school in mind there should be classes in industrial and commercial courses. The industrial courses should include classes in machine work, woodworking, printing and bookbinding, electrical work, auto repairing and mechanical drawing for boys; and classes in household arts, home budgeting, sewing, millinery, cooking, nursing and power machine operating for girls. The commercial courses should include office routine, business practice and elementary salesmanship, store merchandising, bookkeeping and typewriting for boys and girls. In addition to the aforementioned courses, there should also be general improvement classes for the further prosecution of academic work those whose mental equipment is limited and also a reservoir class the curriculum of which is so designed and organized as to facilitate study of the child's vocational aptitude and serves as the source from which the other classes are supplied with candidates to pursue the various courses. All classes are segregated according to sex and the boys' and girls' divisions are housed in separate buildings. The instruction of the school is divided in all industrial and commercial classes into two hours of shop work and two hours of related and cultural work. In all general classes for the further prosecution of academic education, the entire four hours of instruction is given to a study of the three R's, basing the work on interest factors in order to hold the attention of the children. The studies which should be pursued are instruction in shop projects or commercial occupations, according to the election of the student for two hours of the four hour period, and the remaining two hours should be assigned to academic schooling in commercial arithmetic, commercial correspondence, biography, history, community civics, business spelling, industrial and personal hygiene, and commercial geography.

The following chart is illustrative of the time allotment to the various courses:

Program of Studies.

General Improvement Course—
- 8-9 o'clock—Commercial correspondence, community civics.
- 9-10 o'clock—Commercial arithmetic.
- 10-11 o'clock—Business spelling, commercial geography.
- 11-12 o'clock—Business English, Industrial and personal hygiene.

Prevocational Trade Instruction—
- 8-9 o'clock—Trade Instruction.
- 9-10 o'clock—Trade Instruction.
- 10-11 o'clock—Shop mathematics, industrial safety, personal hygiene.
- 11-12 o'clock—Trade and Cultural English, Spelling, Community civics.

Prevocational Business Practice and Salesmanship—
- 8-9 o'clock—Business English, business spelling, community civics.
- 9-10 o'clock—Commercial Arithmetic, personal hygiene.
- 10-11 o'clock—Business Practice, Commercial Geography.
- 11-12 o'clock—Salesmanship, Debating.

The aim in all continuation school instruction is to make the work as practical as possible, and duplicate actual industrial and commercial conditions. All the shops are equipped with man size machinery and a commercial product is produced. These commercial products are possible in the machine, woodworking, sheet metal, printing, and power machine departments. The electrical shop due to child labor laws which prohibit the performance of outside installation work by children 14 to 16 years of age is thus restricted in production. A series of commercial exercises is substituted for actual production in the electrical trade instruction. The products of the different shops are quickly sold either to the children at cost, or to manufactures at a selling price slightly more than the cost of the material employed in the production. The academic instruction in all prevocational classes is linked up closely with the trade or commercial instruction given in the shop. All the work of the school is clothed in interest factors which underlie the very fabric of instruction. That which is practical appeals to the working child whereas mere theory does not attract. One of the constant problems of the continuation school teacher is the application of ingenuity and resourcefulness in the discovery of new methods of creating interest.

Schedule of Assignment.

The pupils attending continuation school are assigned to class on a particular day according to their previous scholastic training. For all trade classes the following schedule of assignment has proven very practical:

Monday, Seventh grade boys and girls.
Tuesday, Eighth grade boys and girls.
Wednesday, high school boys and girls.
Thursday, elementary school graduates.
Friday, Sixth grade boys and girls.

Grading pupils according to their previous scholastic attainment forms a very effective grouping for instruction. The utilization of the different days in the school week operates to best attain this end in all industrial courses. Commercial classes presuppose a constant minimum scholastic requirement, e. g., typewriting requires the completion of at least one year of high school instruction. It is obvious, therefore, that candidates for commercial courses can be assigned to any day in the school week inasmuch as the initial entrance requirement is the same for all students. Em-

ployers cooperate willingly in the original assignments of their employees to attend school. The requests for a change of day are very few, not more than 2 per cent of the entire student body requesting a change thru their employers.

The Reservoir Class.

On entering the part-time school the pupil is immediately assigned to the entry or reservoir class. The importance of this class in all continuation school work cannot be over emphasized. It is the crux upon which all instruction depends. The success or non-success of the vocational instruction given depends largely upon the apperceptive basis which is first formed by the pupil on his day of entrance and stimulated thru his residence in the reservoir class. As the name implies, this forms the fountain from which the other classes are supplied with talent.

The different phases of vocational activity, the qualities and aptitudes required in all vocational fields, the scholastic attainment which the candidates who intend to pursue these courses must possess are here enumerated and explained in detail as well as the positive physical handicaps which would debar any individual from prosecuting a particular trade or vocation. Vocational selection and choice is constantly urged on the pupils thru environment and practical appeal. The child is shown the products and the actual workings of the different trades and occupations which he or she may be interested in. In this manner their vocational aptitudes and penchants are studied. If the pupil can meet the scholastic acquirements which are pre-requisites in all vocational work, he is then permitted to pursue the course of his election.

After a sufficient trial in the selected class, the pupil either finds that he is suited for the work or has no vocational adaptability for it. The negative of the foregoing conclusion is equally important with the positive, for it becomes very definite information for the child's guidance in the future. Assuming that the student does not like his first choice he is given a second, third, and fourth, and if necessary a fifth choice, and if at the completion of his continuation school career he has found out definitely the type of work for which he is fitted or that for which he is not fitted, the part-time school has been a positive benefit to him industrially.

It must not be imagined that transfer within the continuation school is easy. Transfer should only be possible when the child evinces a sincere desire to change his course; he should have a reason for doing so, and this reason should receive the approval of both his employer and parents. In addition to these conditions he should also remain in a particular course a sufficient length of time to prove conclusively that his reason for changing is not a transient one but is founded on real causes. Freedom of choice in all part-time education cannot be encouraged too strongly. It is the broadest avenue open to success and to the self-discovery of latent powers and possibilities inherent in the child.

Follow-up Work.

In order to give efficient instruction in a part-time school an effective system of follow-up work should be inaugurated. Boston has devised a unique scheme of visitor work consisting of visits to the homes and places of employment of these employed minors. The obvious purpose of this visiting is to study the social and industrial atmosphere in which these children live and toil. The information procured is of inestimable value in furthering the instruction of these minors vocationally. The cooperation of employers, which is highly desirable, is obtainable thru an efficient system of follow-up work. This unique type of school which is peculiar to part-time and cooperative courses enlists the sympathy and cooperation of the employers in the education of their employees. Visitor work forms the link which aids the teacher in giving instruction on any subject. The trinity of responsibility between the child, his employer, and his school is especially emphasized and is made the basis of effective training in citizenship. On the other hand information procured by the instructor in his follow-up visits to the homes and places of employment can be utilized in furthering the instruction of the employed minor and in preparing him for his next natural step in progression. The importance of follow-up work cannot be overestimated since the success or failure of the instruction in the school depends upon the information received thru efficient follow-up visits. The truth of the above statement will be particularly apparent when it is remembered that one of the functions of the continuation school is always to help and instruct on employment, making the employee a more competent producer and a more contented member of society. Approximately one-third of each teacher's time should be spent in visitor work. The daily program of all instructors should consist of four hours of instruction and two and one-half hours of follow-up work.

(Concluded in July.)

A great many persons try to do everything with a short line. The fish that lie sleeping on the coral bottoms of Turtle Harbor, twenty feet under the bottom of your boat, cannot be reached by your holiday line of twelve feet and no more.

To leave school with only half a preparation, or to run away from your trade without full training, is to go out into life with a short line that will not give you success.

JOHN WANAMAKER.

COOPERATION OF THE SHOP AND CLASSROOM

Leroy M. Twichell, Director Continuation School, Malden, Mass.

IT HAS not been a great while since the various forms of industrial work in the public schools were on the defensive. During that time, many and varied have been the points of argument between friends of this movement on the one side, and those on the other side who considered it an expensive appendage to an already over-crowded curriculum. We have anxiously watched as the cause has been nursed thru feverish periods of over-emphasized talking on points such as "motor coordination," "manual dexterity," and "cultural values." We have held the spoon while it has been forced to swallow large doses of formal discipline, which, by the way, almost caused its demise.

From this mist of varied and partly-formed ideas, educational thought has gradually crystalized until our aims have become somewhat definitely established. We have come to realize that in the sense of the training of the lower grade hand work, the cultural values of the elementary industrial arts, the prevocational experience of the junior-high school, and the training for specific ends of the vocational school, it is the boy and the girl, after all, that we are trying to develop.

One of the best things we have done is to substitute social values for formal sequence ideas. We have put out the "coat-hanger" fiend from among us. Except for a few uncovered spots, he had gone, script and scrippage.

The best thing that we are beginning to do is to bring the classroom to life by interpreting its subject matter in terms of the world's work, and thus provide a point of contact. Loud has been the cry for motivation or vitalizing of school work. Those subjects that are seemingly so far removed from the immediate needs of the pupil, should be given more appeal, we have been told.

Here then, it would appear, is our opportunity to tie up a series of shop activities with classroom subjects, usually presented in a more or less formal manner, until both are united in a common project that lends itself to the sympathies and appreciation of the pupils.

THE CLASS AT WORK ON A COOPERATIVE PROJECT.

This is by no means an easy task. If, however, the pages of history are to cease to be merely sear-and-yellow leaves from a dead past, and can be brought to reflect life in the doings of our workaday world; if the ability to use good oral and written English can be something to wish for, because the need is felt; if arithmetic shall become one of the many tools with which to work, rather than something to be learned; if places on the map are to become important because they hold or have held materials that we need or use, and because something is going on there in which we are interested; if science can explain some of the wonders with which we come in contact; then related work is worth while and the teachers of related work have not striven in vain.

The possibilities of this sort of work are endless. There are, however, several problems to be solved: One of these relative to organization, is whether this kind of a proposition can be successfully operated in school systems where large classes, uniform requirements, and departmental supervision of classroom subjects make it impractical to use methods which are essential to this kind of work. Large classes are impossible if the work in the shop is to be arranged to furnish the greatest inspiration or basis for classroom activity. Uniform requirements must be stated in terms of essentials to be covered and not in specific or detailed outlines of no elasticity. As to the supervision of classroom subjects, often by persons of academic and institutionalized tendencies, somewhat out of touch with the grades in question, and entirely unfamiliar with the aims and values involved, and sometimes unsympathetic toward its achievements; the least that shall be asked is that these people shall endeavor to get an understanding of the thing they are supposed to assist in.

If given a reasonable opportunity, a team of interested teachers can lead a group of pupils to see that there is something to school work besides that which would otherwise be considered, by the less imaginative members, as a useless grind. In fact enthusiasm may be aroused.

A project carried thru by two classes in the Central Street Junior High School at Springfield, Massachusetts, may serve to illustrate the method of attacking a related-work problem. This project, the making of 25 fireless cookers, has been chosen because it represents two activities, woodworking and sheet-metal work. Indirectly the cement and printing departments were also affected.

The work in the shop and that in the classroom should of course, proceed together, because academic work that is related to shop work in general rather than a specific job is of little value.

Pupils in the practical-arts department, including the two classes mentioned, spent ten of their 35 periods per week in the prevocational shops, changing their activities at the end of every ten weeks, this large amount of time being justified by the material and inspiration received for classroom subjects as well as by the tryout experience of the various activities. All arrangements were made possible by Principal A. T. Talmadge, who, being interested in this work, was determined to give it a tryout.

Thus having set the stage, let us proceed with the program. The members of the Jr. II woodworking class, after discussing the merits of a fireless cooker, readily accepted the suggestion that they construct the cases for a number of these utensils. Accordingly, a set of shop cards were made up, giving specifications and working drawings for a fireless cooker that would meet the home needs of the boys' families. These were explained with blackboard sketches and demonstrations, and then given to the boys who were to act as foremen of the various groups. The stock clerk was called upon to issue lumber and supplies to the various departments. The tool man passed tools thru his wicket in exchange for a slip written and signed by each boy. The time clerk made ready his blanks and work sheets and the hum of industry was on.

During the discussions and explanation of the job cards, each boy had filled out his assignment sheet which he carried to his classroom. On this sheet he had all the necessary data for starting the related work in the class. A similar sheet was then sent by the shop instructor to the teacher. This is not by any means all the necessary communication between these two people. The class teacher is seldom an experienced mechanic. Therefore, he or she will require considerable explanation in addition to the specifications and drawings. Likewise the shop instructor needs to know the limitations and possibilities of the class procedure. He should know also what topics the teacher wishes to cover in the various subjects so that he may plan the shop work to include as many of these as practical. Altogether there will be need of many conferences, as cooperation to the limit is the keynote to success.

Each day when the class came to the shop, a few moments were devoted to the discussion of the work and its progress, other related work assignment sheets were made out, and interesting incidents and experiences in the trade were told by the instructor, related industrial topics and shop ethics were introduced.

Occasionally a period from the shop time was taken for stereoptican stories of forestry, lumbering, milling and manufacturing.

During all this, instruction in the operations was not neglected. Formal sequence in tool operation, other than that demanded by the logical procedure of the job, was eliminated. Criticism of poor work was mostly in the form of encouragement to do better rather than condemnation.

All this while, the boys in the Junior III class were laying out, cutting, forming, seaming and soldering sheet metal. They were making the wells and metal parts for cookers. Aside from the material and operations, their organization was similar to that of the woodworking group.

Elementary science, being one of the subjects taken by this group, was worked out in the shop with the shop instructor. Many topics were directly related to the cooker and its making.

A third class in cement work made the concrete heating elements for the cookers, and of course, the class in printing furnished all printed forms for the shop and classroom work. Finally, as the last week of the ten arrived and the business of the finishing department was flourishing, many requests for cookers were received by the clerk. Pupils from the other classes, teachers and outsiders seemed to realize their need of a fireless cooker. Members from the classes came first, however, and after their wants were filled there were but few cookers to be had.

HEIRLOOMS OF THE PRESENT AND FUTURE

Charles A. King, State Normal School, Plymouth, N. H.

WHO IS not sensible of the subtle charm, the dignity and the atmosphere of repose and classic simplicity characteristic of homes in which the decorations and furnishings are centered around cherished pieces of old mahogany, silver, pewter and other reminders of cultured ancestors? It is not strange that their present owners value them so far above their intrinsic value that they are never thought of in terms of dollars and cents. The atmosphere of good taste and refinement ever present in these homes is emphasized by its absence from homes furnished with the nondescript suites produced in enormous quantities during the years in which atrocious adaptations of period and historical designs held a strangle hold upon the popular taste in home decoration and furnishings.

For two generations beautiful pieces of mahogany were out of style and, if not destroyed by neglect or abuse, were relegated to menial uses or stored in attics or lumber rooms. Thru avarice or indifference many of these pieces passed out of the family and in some cases fell into the hands of those whose artistic taste and vision, or business instincts foresaw that some time good taste would again dominate the furnishing of the homes of people of intelligence.

Many pieces of furniture owned by descendants of the pioneers were made of timber cut from the ancestral

FIGURE 1.

FIGURE 2.

acres; usually of random design, made with the rough tools found upon a frontier farm, and often of mediocre craftsmanship, there is seldom anything but age, authentic history and family sentiment to explain the reason for their hold upon the family affections. Such pieces are of little value to the dealer or collector whose interest in the antique is based, not upon family sentiment, but upon excellence of design, workmanship and historic significance as expressed by conformity to historical and period types which are the main contributory factors to the present popularity of old mahogany. In other words, heirlooms to be appreciated by those who have no sentimental connection with them must have the subtle proportions, and that form and workmanship, which, regardless of any other quality, or of sentimental considerations would place it among works of art. Such pieces of good design and workmanship are in accord with the best artistic ideals of all eras of the world, and will forever maintain their dignified simplicity; while fads and fancies in various types of furniture come and go, these pieces are ever the inspiration of the lover of the beautiful. The length of reign enjoyed by a fad depends upon the degree to which it conforms to true form and proportion when weighed in the balance of good taste, for within the degree of true beauty which it possesses will be found the

FIGURE 3.

factors that limit its reign, and indicate the degree of cultured intelligence of its devotees.

An increasing number of purchasers refuse to follow the methods of acquiring furniture which has obtained during recent generations, when the average purchaser made his selection piecemeal from miscellaneous assortments of ready made furniture of all grades and prices. More than ever before does the expression of the popular taste indicate that people from all walks of life realize that simplicity is the fundamental principle of all good design, and that the beauty of a piece of furniture depends as much upon its relation to its surroundings as upon its individual qualities. To the extent that modern methods of production permit and encourage, we are acquiring methods of furnishing our homes which three generations ago were inseparable from the purchase of such important pieces of furniture as the eighteenth century highboy, table and mirror frame shown in the illustrations. Usually such important additions to great grandfather's household equipment were built to order; the grain, quality and form of each piece, and each detail of construction was carefully scrutinized and considered, to insure that the material and workmanship were worthy of their high destiny.

Furniture was built for permanence in the days of our ancestors, for it was the sentiment of the times that a need of the home once satisfied should never occur again; it was taken for granted that the piece would satisfy similar needs thru succeeding generations until finally worn out by service. The popular idea of the immediately preceding generations was to change the furniture in accordance with the dictates of Dame Fashion, or, as a change in worldly circumstances made it possible, to refurnish the entire establishment; hence it was not necessary that a piece should be built with any regard to its use beyond the immediate needs of the original owner. However, there is a considerable and rapidly increasing number who believe in building furniture of such design and workmanship that it will always be worthy of a place in their homes or in the homes of their descendants. These, like their ancestors, believe that furniture indicates the culture and the ideals of those who occupy the home, and endeavor to surround themselves with accessories which express their personality.

The laws of design and ideals of fine workmanship have resulted from the elimination of undesirable features during different stages of furniture development, and the incorporation of those elements which were pleasing and harmonious. From the times of the great masters of furniture making, in whose work the climax of furniture designing seems to have been attained, down to the present time nothing essential has been permanently added to either design or workmanship. The best designs of today are based upon the same laws which guided the great masters, tho the liberty of personal interpretation of these laws is by no means curtailed. Many interpretations by different individuals have resulted in beautiful pieces showing the personality of the designer, which may well rank with the best work of the old masters; but no interpretation which differs widely from their motives has yet obtained a footing or degree of permanence which indicates that it would ever be conceded a place in the history of furniture development comparable with the work of the late eighteenth century.

Despite the fact that much of the furniture built today is of the "Built to Sell" type and will barely endure the service of one generation, there has never been a time when it was possible to purchase better. Custom made furniture of the present time can be as well designed, better made, and a more desirable and larger variety of materials is available than ever before.

Many pieces made today which will be heirlooms to succeeding generations are reproductions, adaptations or combinations of the work and designs of the old masters. Possibly some of them are destined to play false parts in years to come, for they may be sold as real antiques to people who do not know the ear marks by which the genuine may be detected. Many of these

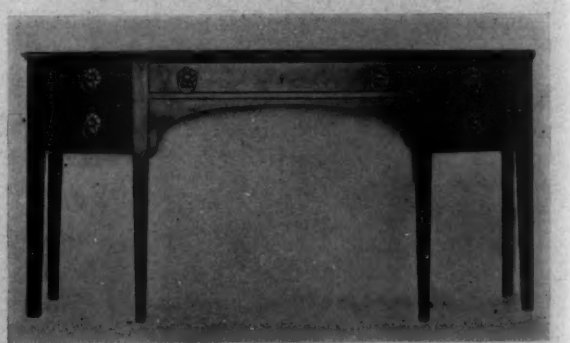


FIGURE 4.

pieces are practically hand made, and so closely reproduce the work of the old time, that in a century it will be difficult to be certain whether a piece is an exceptionally well preserved genuine antique or a reproduction. In fact, commercial conditions governing the antique furniture business are much the same as those which have brought into being the many spurious Rembrandts, Rubens and others of the old masters of painting.

The low boy with the cheval mirror is an excellent adaptation of eighteenth century designs, while the simple elegance of the buffet and sideboard are strongly suggestive of Sheraton influence. These are fine specimens of the type of furniture which is being made to order by skilled craftsmen who can accurately reproduce the ancient ideals and craftsmanship, to satisfy the demand of discriminating purchasers. Many such pieces will descend as heirlooms thru generations which will appreciate and cherish them, for the taste of the people is being so educated that beauty of form and proportion and the mellowness of color and finish is preferred to obtrusively new furniture of faddish or fanciful design and garish polish.

These reproductions are typical of but one phase of the present stage of furniture development, but the influence of the old masters, so long ignored, has at last come to the front, for, thru them this generation has learned that only in simplicity of form, construction and decoration may permanently satisfying beauty and service be found. Future generations will consider the types known as "Mission" and "Craftsman" as typical of the early twentieth century, tho these terms are applied indiscriminately to all furniture which has straight lines and is covered with a dark stain. So much poorly designed and shoddy work has been perpetrated under these names that they are not the guarantee of merit they should be; their very simplicity of design invites poor work, and encourages attempts by those who do not possess the taste to design nor the skill to properly apply and execute the best methods of construction. Well made craftsman furniture should last as long as the wood itself, and unless destroyed by fire or abuse, much of the work of the present day will be in existence and in good condition after hundreds of years.

FIGURE 5.

FIGURE 6.

The popular interest in hand work, home craftsmanship and the manual arts of the schools is an important factor in the uplift to the popular taste. Few families within the range of the public schools but have one or more pieces made in the manual arts classes; often these have been so constructed that they do not have the strength characteristic of the type. This is especially true of many of the pieces made by children of the grade schools, who are easily satisfied, and whom the teacher allows to use forms of construction which would not be permissible upon ordinary commercial work. But more mature students may well be proud of both the design and workmanship of such pieces as the seat which was designed and made by a seventeen-year-old student, and the table, which was made by a young lady of a normal school. The seat is a characteristic craftsman design, with its straight lines and apparent strength, but without the clumsy massiveness of the mission furniture, while the design of the table partakes of the delicacy of the old masters. A great deal of furniture of these types will descend for generations, for each type is satisfying in design, workmanship and utility.

Heavily proportioned mission or craftsman furniture is suitable for large rooms only, as they require perspective to be properly appreciated. Tho the hall, dining room and library are the legitimate places for large and massive furniture, any room may be furnished in the craftsman style if suitable pieces and proportions are selected to harmonize with the size, purpose and decoration of the room, for example, the craftsman type of table shown in the accompanying cut. It is possible that in another century fine examples of craftsman furniture, because of their originality, excellent design and unquestioned authenticity, may be considered of more interest than exact copies of the old masters, which, like copies of the great painters, will be considered of slight artistic or historic value.

Only in the homes of the discerning, not necessarily the homes of wealth, is the importance of harmonious and reposeful surroundings appreciated, and only those who realize that in the selection of furniture which is to occupy a place in the home, intelligent care and thought are necessary. A modest home may be as tastefully, if not as expensively furnished as one in which a professional artistic decorator and furnisher has had carte blanch.

Much of the better designed and made furniture of today will be valued by future generations quite as much as are the pieces which have descended from Colonial times to their present owners. Hence if the purchasers of furniture of today desire that their memory shall be kept green, and their personal belongings cherished by their children's children, they must realize that the considerations of first importance are utility, beauty and permanence, and that the initial cost is of slight consequence.

THE CLASS PROJECT IN DESIGN—III

Edward J. Lake, Professor of Art and Design, University of Illinois

THE DEVICE OF UNITS.

THE DESIGN of initials, monograms, bosses, panels, borders, etc., to be used for the enrichment of objects made by industrial art classes, are in themselves problems that require the same careful adjustment as the objects to which they are applied.

With a poster, book cover, garment or piece of furniture on which such units may be used, the device of these units becomes interesting and practical. Balance, rhythm and harmony are necessary to the parts of a design as well as to the completed design.

Appreciation for "beauty of propriety," which every teacher of design hopes to develop, cannot be developed by spending all of the brief, precious time of the school year on two or three designs that may be executed in actual materials. Exercises in design must be given which will call the judgment of effects into constant application. The results of a few such exercises are illustrated.

Balance comes first as the element of all design that must be secured. The balance of several shapes to make a unit of attractive form is an exercise that leads to the discovery of other effects, such as rhythm and harmony.

The designs shown are made of shapes cut from thin black paper mounted on a white card, or shapes drawn in outline and painted in with black ink. Squared paper may be used to secure symmetry in the adjustment of shapes, as well as in the device of the shapes themselves.

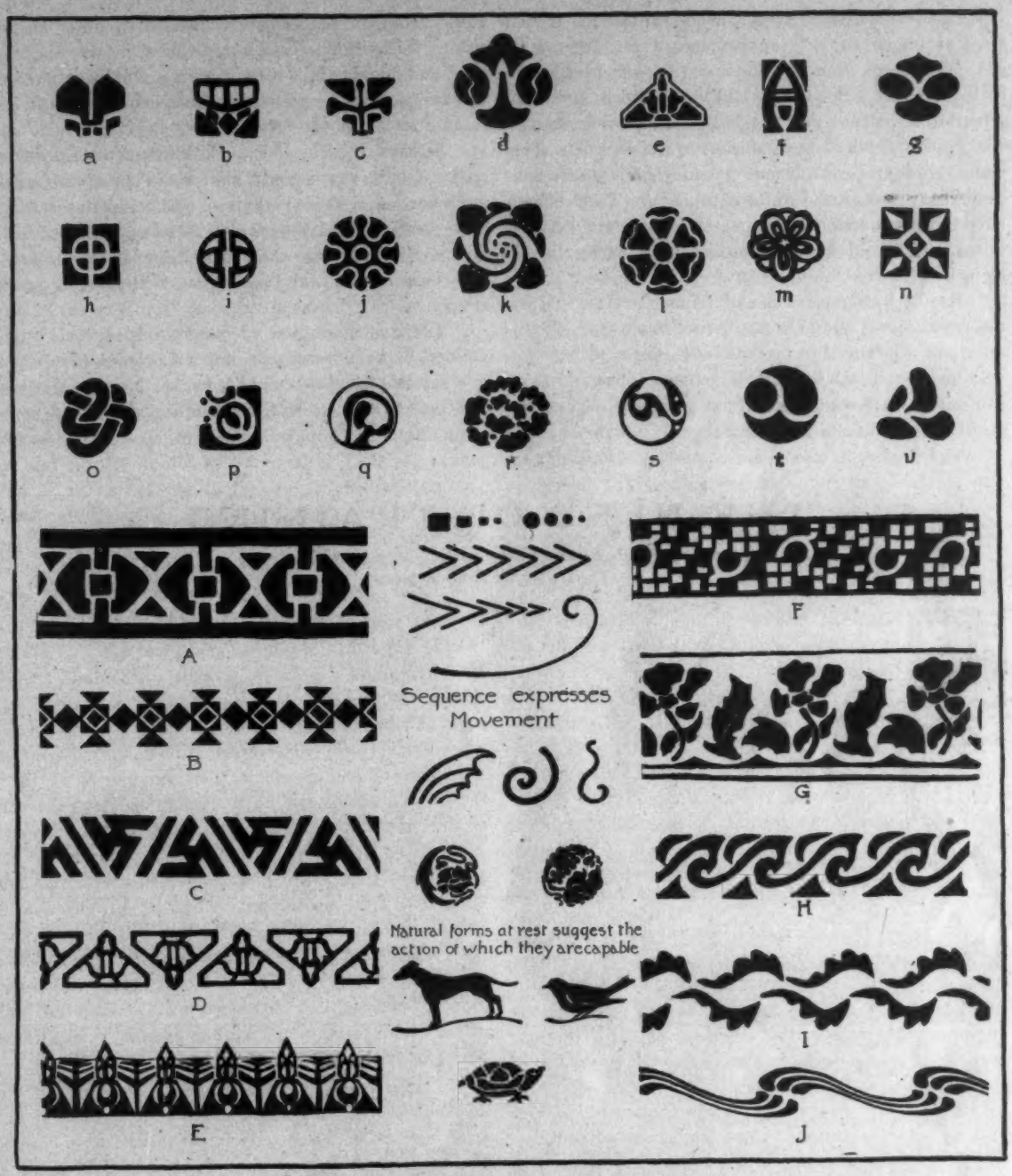
Single inversion over a vertical axis, as in a, b, c, d, e, f, and g gives a pleasing, orderly effect, but is not fine in result unless the white and black shapes are in suitable quantity, size and form. The tendency of beginners in design is toward elaborate effects and too little consideration of the space relations. The background areas must be made interesting and important as well as the imposed shapes.

Double inversion, as in h, i, j, l, n, gives more formal results and restricts the movement of the design by opposition in relation to two axes in place of one. Comparison between those units that are in symmetry over an axis with those that are in double inversion over two axes convinces the designer that the more orderly restraint that is put on forms in design, the more formal and fixed the design becomes. Mere order which holds the parts of a design under restriction, is dignified and severe, but becomes tiresome unless the forms themselves are especially interesting or well interrelated.

A radial unit, as j, l, or m, is held in restraint by relation to a common center. In j the action is outward from the center; in l the action is from the outside toward the center.

Units h, i, and n are related to the horizontal and vertical axes and are alike, tho reversed in the four quarters.

Units o, p, q, r, s, t, u are not symmetrical over the horizontal or vertical axes. They are held in least formal restraint, but are balanced by a careful adjustment of rhythm. If they are composed of interesting forms, so related that they hold together by reaction on one another, the unit will be pleasing. In o the unit is held together by interlacing, as a loose-knot or braided band is held together. In p balance is secured by the enclosure on two sides and related spots and curves. Notice how the inner curve reacts against the



EXAMPLES OF UNIT DEVICES WORKED OUT IN THE AUTHOR'S CLASSES.

enclosing angle and yet conforms to the shape of the enclosing angle. Units q and s are enclosed circles that hold in easy restraint forms that have common curves.

It should be observed that rhythm is a most interesting effect in design—which may be expressive of a great variety of kinds of movement from the slow formal movement that results from symmetry and radiation, to the graceful and even violent action of abrupt change in direction, measure, interval or tone.

Sequence is a certain method of securing movement in composition. A series of spots of decreasing size gives the impression of movement from large to small. So, also, does the decreasing size between converging lines direct or index the interest. Again, in a sequence of curve, as in the plume or growing plant, the action is graceful, forceful or abrupt in degree with the change of curvature. Those natural forms that are most beautiful and interesting have this element of rhythm that is controlled by sequence. The wing, the volute and the spiral are recognized examples of controlled and orderly sequence.

The forms of animals and birds express the movement of which they are capable, even when they are at rest. The swift running animal or the swift flying bird is designed for rapid motion. This should be noted as a matter of interest and suggestion in teaching design. The growth of plants is significant to the designer. The great variety of forms in nature have their peculiar motion which conveys a definite impression. These effects have become common to the student, but should be recalled as material for the composition of effects in design.

Bands, borders, crests and fringes are devised by the repetition of single units in two directions. If the units are rhythmical in one direction, the repeated unit will be rhythmical in that direction. Alternation of two units of different size or form gives a variety of interest that results in a halting rhythm.

The borders a, b, c, d are composed of rectangular and triangular shapes which hold each other in restraint. Rhythm is especially evident in the diagonal lines and edges. E is a crest with a dominant rhythm upward, suggesting transition from one field of design to another.

Borders f, g, h, i, j are less formal because composed of units that suggest motion. They are arranged in order of increased rhythm. G undulates with a slow, heavy movement. F dances along with a vibrant action. H moves forward with strong, vigorous force. I is more rapid, and j is leaping with long, graceful strides.

The beauty of these effects depends on their application. The designer must learn to choose effects that are suitable to the desired purpose, but the designer must observe effects of various sorts and learn to devise them in order to make intelligent application to purpose.

THE NEED OF TRAINING

Homer J. Smith, Assistant Professor of Industrial Education
The University of Minnesota

SUMMER always brings to teachers increased opportunities for study and for association with those of similar interests. The summer population of the training institutions increases steadily and a marked change has been noted in recent years on the part of industrial and vocational teachers toward this avenue to professional improvement. Those charged with the direction of training have seen to it that the offering is more diversified and definite so that one may no longer plead the school's failure to touch his vital interests. All may now be sure of return.

We believe that ultimate success in a profession and the time necessary to attain one's greatest usefulness in it are dependent in large measure upon his initial training for the work. The lawyer, the physician, or the engineer who attracts the attention of his fellows is very often known to have been early well grounded in the principles basic to the field. It is appreciated that he rises rapidly thru ability to study cases in practice and to make adaptations to new conditions without losing sight of fundamental truths and aims. If we will, for the moment, disregard the influence of native ability and personal attractiveness on teaching success, we shall doubtless admit that those in our own profession who enjoy high praise and first distinction in rank and salary are those whose preparation was strong and, likewise, who make surface changes compatible with deep convictions.

Self-satisfaction is not a condition to progress. We must be uncomfortable to be progressive. We must take precaution to keep from the ruts or by-lanes, and the best means to be truly fortified is to know the last determinations of our foremost research men, administrators, and students of method. To read the general and specific literatures of education is good but it is always in unfavorable comparison with attendance upon classes. We need to hear and to take part in discussions of new movements under leadership of those who can conduct them with respect to established policies. We note a returning summer after summer to the institutions of training and an increasing ardor on the part of the "repeaters." Many who never matriculate succumb to an awe of the institution or labor under the assumption that nothing of consequence is to be had. Some have been discouraged by lack of entrance qualifications but need no longer delay for this reason. Colleges now admit *adult specials* who work for certificates if not for graduation and it is hoped that the time will soon be when skilled craftsmen will be examined and given a high fraction of credit in courses which the experiences have paralleled.

The purpose of the present writing is to present the advisableness of class attendance by all types of industrial teachers and especially by those who have entered the work directly from other vocations. The assimilation by the teaching fraternity of women and men trained for service in the industries has been a great problem and we have made much progress. We have perhaps gone farther toward a solution than we would have done in attempting the reverse situation, i. e., the fitting of the skilled teacher into the most difficult service called for from engineers, or pattern-markers, or milliners. To transfer one's interest from production to the intangible results expected from schools is to attempt no easy task. There is too great a gap.

In the factory things are made after specifications; the product can be handled, checked with the plans,

changed, and, if need be, scrapped. The finished piece can be followed to its destination and watched in its functioning. If error is found to exist no greater harm will result perhaps than the loss of a job by the workman or of decreased patronage for the employer. Unworthy or incompetent effort means loss of dollars or vexing delay and occasionally injury and death. In the school, on the contrary, we have no definite specifications. Our products are unmeasurable in the last analysis. We cannot "throw out" and forget the percentage of spoiled pieces; neither can the materials work back to the raw and come thru again for better handling. We have only begun to follow school output to its destination and to test its functioning. Almost nothing has been accomplished in readjustment to life's demands, once the trained youths have left our hands. In cases of error the workman, the teacher, seldom suffers and officials cannot well be held to account. Competition is not sufficiently forceful; there is little apparent use to check. The misfit alone suffers in that he is underdeveloped or prepared for a condition that he does not meet. The result is loss of reward and interest and happiness, in most cases forever. Who will say that the cases are parallel? Who cannot see that the productive industry and our profession are fundamentally different? Preparation for the shop task does not necessarily fit one for classroom service and it may really unfit him, for some habits and attitudes will need to be lived down before more desirable ones can take their places.

I would not be misunderstood, I do not oppose continuance of the step we have taken. I would not bar the artisan from our ranks. We need him. We shall need more of his kind as the work develops. We may find it proper to limit the range of his service to the technical courses of the senior high school, the trade-training institution, the evening school, and the part-time class. I am sure any such tendency will receive his own endorsement and support. We shall surely need a greater number of "artisan-teachers" but may be content with a decreasing ratio thru a narrowed field of work. The movement in question has been a good one, is older than many suppose, was augmented by the war, progresses now, and seems likely to continue. We ask only for more educational preparation and more professional training. We want to encourage improvement-while-in-service and to do it not by the inducement of higher salaries alone but by a logical presentation of the real reasons why training is important. Those immediately concerned should be pleased to have the question dealt with concretely and those who direct may find here what will call out more constructive and sympathetic help. Administration work may have so robbed our minds of concern for improvement in teaching that many people of promise have even now been lost. The fact that so large a number of trade instructors show real aptitude for teaching and skill in it, in the absence of training, should urge us to keep a man and to develop every trait that he possesses which fits the professional requirement.

What are the requisites of good teaching? In what way do the practices of shop life tend to train toward or away from good teaching? What major difficulties are faced by those making the change? What methods of improvement are most favorable? What standards of professionalism need most to be called to the beginner's attention? These are the questions which need to be answered in detail and with candor.

A teacher must know the subject matter to be presented. Just here a tradesman meets our requirements admirably for his experience has been a steady accumulation of facts and skills in the trade and of knowledge of the various ways of accomplishing the same task, with their comparative results. He possesses first-hand, reliable information in a setting so practical that his usefulness to groups soon to enter industry cannot be denied. If there is any possible chance of his not being prepared as to subject content it is because he has over-specialized, is not generally grounded in the vocation. The number of such men and women in a given community is apt to be large but few will apply for school work and some of these will be refused. We have few places for the vocational specialist.

A teacher must be acquainted with the nature of youthful minds. He must be able to recognize individual differences and capacities. Is the artisan so equipped? Perhaps not, and he is not to blame. He may have worked where the product was constant, where each man turned out the grade of work which the employer found it to his advantage to produce. Regardless of his ability to do better work he had to do the common job. Unmindful of the abilities of the men at benches and machines a foreman exacted a product, unvarying in material, in exactness of form, in finish, while he called for a rate not too far from average. Such conditions are not met with in the classroom and he who has worked long under them is to some extent unfitted for teaching. Students must be studied as individuals differing in native ability, in their subject interests, in ages and sizes, and in the purposes for which they have enrolled. Our aims are to develop their full powers and to avoid studiously what may thwart their unfolding or seek to hold any to the level of the group. We do not seek a common performance. Run to its limits, our business is to make people different because they are primarily different and because school work should bring forward what lies all but dead.

Again, the teacher must realize that young people, all of us for that matter, are but machines after all, so constituted that they react in certain precise ways to situations met. He must know that there are definite laws of learning which it is only economy for him to understand. He must be aware of the tendencies inherent in those he instructs and that it is his business to bring out some of these tendencies, to stifle others, and to modify still others so that the consequent actions

will be for the good of the student and of those about him. These facts lie in the field of educational psychology which the teacher trained in an institution is more apt to have studied and more sure to keep in mind as he does his work. In the knowledge of human nature the artisan seems not to meet the standard of his mates and should do what he can to build an interest in this fascinating and necessary science.

In addition to familiarity with usable subject matter and the knowledge of the laws of learning, the teacher must be versatile in methods and class management. He must be able to see student types and be appreciative enough of varying needs to know that a given course outline, however long it may have taken to devise it, is not suitable for several classes. He must be skilled in group study and in the preparation of courses to fit conditions as he finds them. He needs to know the various types of lessons and which one is most happily chosen in a given instance or how they may be merged. He needs to have some ideas about discipline beyond the hire-and-fire order to which shop service has accustomed him. He ought to be able to point out errors, with the reasons for them and to motivate better work, forsaking his inclination to have the student stand aghast or smiling while he himself gives perfection to the piece. He must learn that school tasks are in sequence, not isolated as they come in life, each to be done in the quickest and best way which suggests itself. He will do well to wean himself from the desire to make a showing and to urge himself continually to stress ideals in work and in conduct toward it. He must realize that we train not for the youth's first job but so that no work of his choice may ever be denied him. We are obligated to send out ready and hopeful young men and women—ready because they have not been fitted to a known groove and hopeful because self-assured thru a variety of preparation.

And there are also the extra-class activities—a general helpfulness about the building as regards cleanliness and quiet—the cooperative relationship with parents and employers and fellow workers—the understanding of supervision and the wish to make it pay—the service of guidance—the expected assistance in athletics and music and program organizations. In these things the vocational teacher has not felt his full responsibility nor has he known the return experienced by those who enter them with enthusiasm for success and to inspire cooperation.

It is a big work we are in, a true profession. We must know the business details of it and cultivate its ideals. Reading helps greatly; visiting days have proved of value; conventions should not be missed; committee work should be accepted; correspondence study has been the making of the thousands. But the present plea is for continued attendance upon classes. It is pleasurable and highly essential that one get into the atmosphere of teaching to examine the new in relation to the old, to sense the difficulties of others in the field, to keep abreast of the broadening conceptions of our work. Every man of us should be identified in some way with an institution of training.

EDUCATIONAL GUIDANCE

Charles A. Wardner, Vocational Director, Jackson, Michigan

THE word "vocational" has so long been applied almost exclusively to industrial and trade occupations, that it has ceased to convey to the average mind the broad meaning which it should have. Therefore, many educators, especially those of the old school, view with alarm the rising movement for vocational guidance and placement. Many of these educators received their early training in the little old red schoolhouse of our forefathers.

Many of these educators having struggled on thru school and college amidst great difficulties, chiefly financial, realize how very few of the children entering school ever get to the college and higher education. To them the college seems to be the chief aim in school life, and, as Dr. Davenport suggests, they are trying to make a trunk line railroad out of the school system and railroad all students into college. As a matter of fact, 98 per cent of them drop out by the wayside and into the past, like chunks of coal from a train, and it is largely a matter of chance what becomes of them.

The movement for vocational guidance and placement sprang up to provide places for these human chunks of coal and direct each one down the proper coal-chute of life or up the right conveyor.

Later we began to see that it was often too late to help a child very much if we waited until circumstances caused the child to leave school and seek employment. A noted person once said, "If you are going to do anything for the average man you must do it before he gets to be a man."

The modern vocational director is striving to prevent the pendulum from swinging too far in either direction and is honestly trying to help each child fit himself for whatever calling seems to fit his particular case and in which he will find the greatest amount of happiness and usefulness to his fellowman. This means that the child needs assistance in selecting the proper course of study and subjects within the curriculum.

Therefore, with all this in mind, we have in the Jackson public schools a department called "Educational Guidance." The following is a brief outline of the ground work upon which we are attempting to build the department.

General Plan of Educational Guidance.

I. *Analysis of the situation.*

A. Vocational guidance in its broad sense, is a continuous process and depends for its success upon the child, the teacher, the home, and the community.

B. No one person is great enough and broad enough to look into the future and select a vocation for any child.

C. The child must be stimulated and guided into making his own choice of future occupation thru:

1. Self-analysis.
2. Personal data.
3. Counselors' advice.
4. Occupational information.

D. The teacher must be genuinely interested and willing to give the subject careful thought. Teachers should understand the child's home life.

E. By the time a child finishes intermediate school he should not only have a strong desire to go on thru high school, but should know definitely what studies he should take up in high school.

II. *Aim.*

1. To stimulate self-analysis on the part of each pupil and develop especially every tendency and interest that may affect the choice of a lifework.

2. To increase the child's vocational information thru English, history, and mathematics classes; later thru life-career classes and a direct study of all local occupations.

3. To study each child's personality, ability, and natural tendencies thru the child's school work and the result of mental and manual tests and measurements.

4. To instill enthusiasm into every child and a desire to learn because of the power and ability to meet new situations derived from applied knowledge.

5. To make prevocational work an important part of the intermediate schools, and vocational work a part of the high school curriculum.

6. To guide intelligently each child in the choice of curriculum and electives within the curriculum, with a view to his probable future vocation.

7. To stimulate each child into intellectual activity and vital interest in school work; so much so that the whole plan of education will take on new meaning and become a pleasure, impelling the child constantly to desire more education, and therefore to stay in school as long as possible.

8. To develop the power of each child to the highest plane of personal efficiency in order that he may fill his place in the world according to his talents and with the greatest degree of personal enjoyment and service to his fellow men.

III. *Method.*

1. Self-analysis of each child thru the use of a questionnaire designed chiefly to stimulate thought on the part of the child, also for direct information. The child must be led to discover his own capacities, aptitudes, and interests.

2. Study of the character and conditions of occupational life and surveys of local trades and industries, also the professions.

(a) Thru English and other classes. Visiting or reading about certain occupations and using the impression and information obtained as themes for essays.

(b) Talks to the class by the teacher or others interested.

(c) Survey by each child of certain selected occupations.

3. Mental and educational measurements of each child.

(a) By a selected method of mental tests.

(b) By a suitable measure of manual dexterity.

4. Forming of life career classes in ninth grade or high school.

5. Leading each child to an intelligent vocational decision himself and the proper selection of studies. Effort must be made to retain children in school as long as possible and to place them in occupations only when necessity forces such action.

IV. *Machinery.*

1. The special work of preparing the child's mind for successful educational guidance must be done by:

A. The regular teachers.

(a) English teachers, thru English composition, oral discussion or debates.

(b) History teachers by short talks or lessons showing how earlier generations chose occupations and developed individual talents.

(c) Mathematics teachers by pointing out the significance of different phases of mathematics in the various callings.

B. The special teachers.

(a) Industrial arts, agriculture, and commercial teachers by making their work prevocational and showing its relation to out-of-school occupations.

(b) Household arts teachers by talks on the various vocations growing out of housework and that greatest of all vocations for women, home making.

C. Principals by talks to groups or the entire school on occupational subjects.

D. The vocational director by talks to students and thru assisting in measurements and tests.

E. Persons from outside of school who may be induced to give short talks on their respective occupations.

F. The child himself who must be made to see that education is largely a matter of personal effort.

2. The home room teachers are to have charge of the educational guidance of the children in their rooms, and keep the records pertaining thereto.

3. Other teachers will be assigned by the principal to assist home room teachers who have charge of the large study rooms, each such teacher being given a group of not to exceed 50 children for guidance purposes.

4. Each child is, if possible, to be under the guidance of the same advisor thruout his seventh and eighth grade course. When he passes into the ninth grade, his guidance records will be sent to his ninth grade advisor and will follow him on thru the high school.

5. Guidance of the child in the choosing of his elective studies for the following semester will be based upon:

(a) His personality and school record.

(b) The data given on his questionnaire and record cards.

(c) The ideas and wishes of the child and of his parents.

(d) Careful consideration of other conditioning factors that will occur to the teacher.

6. The selection of every elective study must have behind it a good and sufficient reason, and should not be based upon popularity of instructor, reputed ease of work, or similar notions in the mind of the child.

7. The principal will assist in different cases by advice to the teacher and personal conferences with the children.

The director of educational guidance will have general oversight of the planning and carrying on of the work, and give help and counsel in individual cases as needed.

V. *Some general considerations.*

1. Educational guidance will supplement the home in giving much needed wise counsel and advice to the child at a critical time in his life, the beginning of the adolescent period. This may be accomplished by

(a) The regular teachers in daily contact with students.

(b) The vocational director in personal talks and interviews.

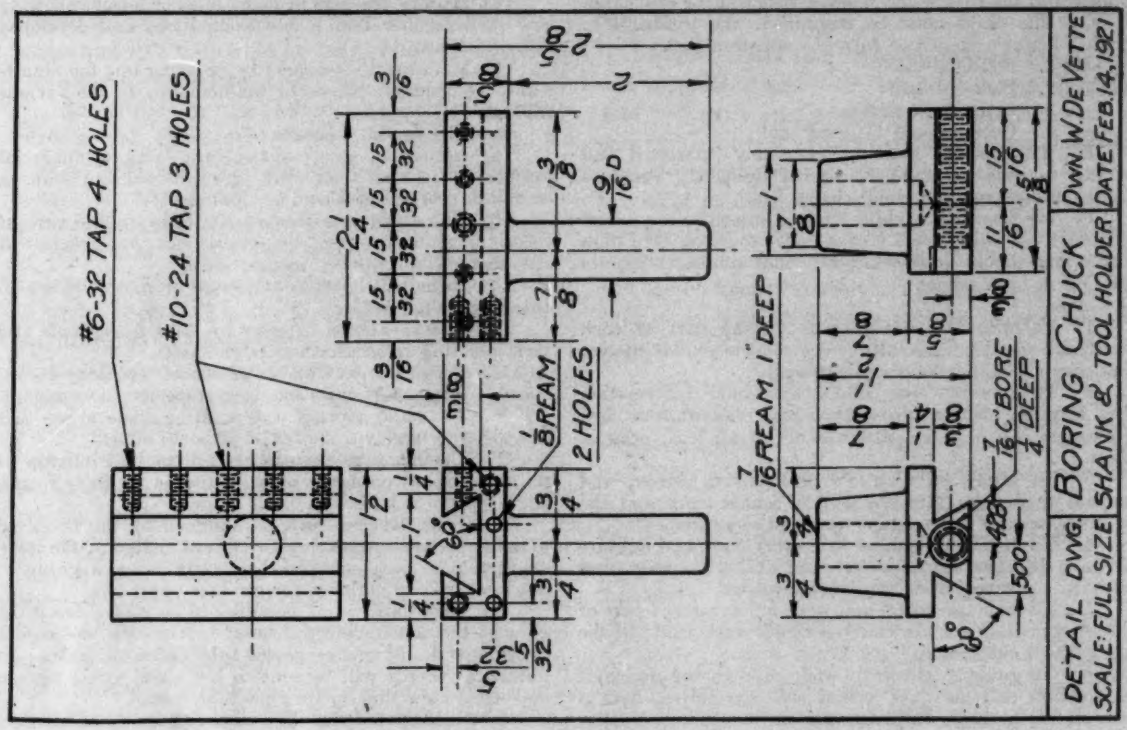
(c) Interview by appointment with some professional or businessman who is a member of an advisory board.

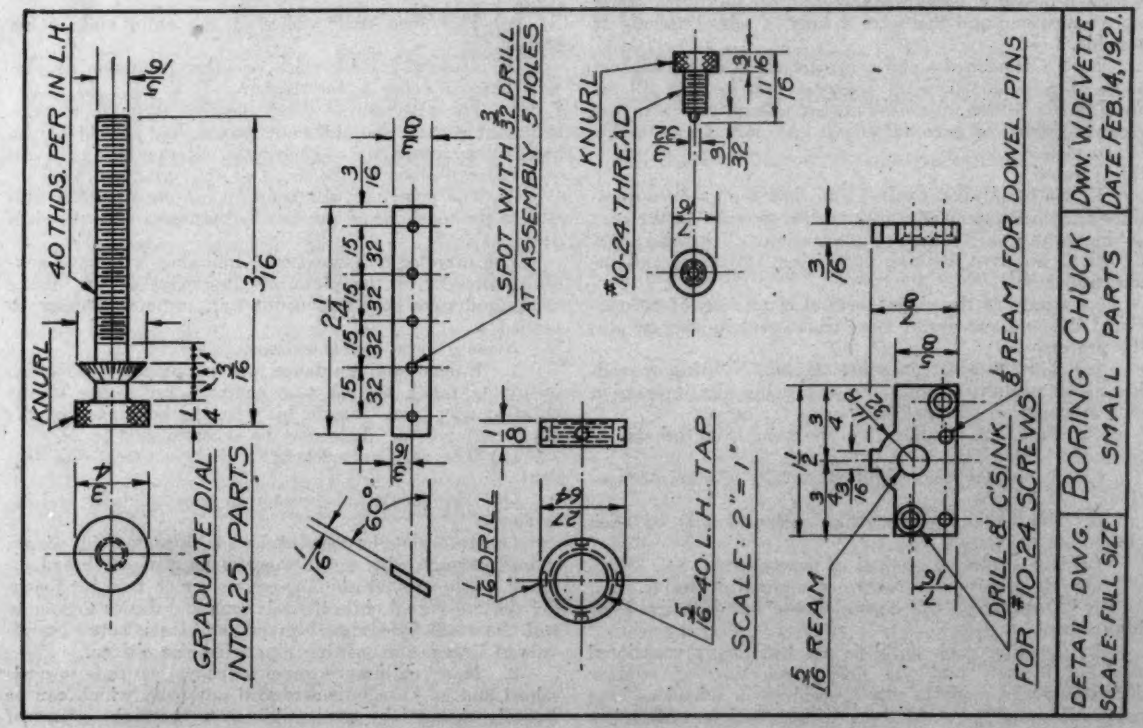
2. Educational guidance offers a rich field for teaching the individual child his relations and duties to society and the state by giving him loftier ideals, better standards of living, and making him a happier citizen.

3. Many children develop a disloyal attitude towards school and an antagonism toward authority which can be entirely changed by getting him into the right course of study, and giving him a definite aim in life.

4. Educational guidance is a continuous process and requires a combination of private work and classwork together with the counselling and followup work.

5. During the time of prevailing high wages many children were prematurely drawn into industries away from the school. A closer relationship between the school, the home, and the business world will tend to correct this evil.


#6-32 TAP 4 HOLES
#10-24 TAP 3 HOLES
⅜ REAM 2 HOLES
7/16 REAM 1" DEEP
7/16 C'BORE ¼ DEEP
DETAIL DWG. BORING CHUCK DWN. W. DE VETTE
SCALE: FULL SIZE SHANK & TOOL HOLDER DATE FEB. 14, 1921


KNURL
40 THDS. PER IN L.H.
GRADUATE DIAL INTO 25 PARTS
SPOT WITH 3/32 DRILL AT ASSEMBLY 5 HOLES
KNURL
#10-24 THREAD
1/16 DRILL
5/16-40 L.H. TAP
SCALE: 2"=1"
5/16 REAM
DRILL & C'SINK ⅛ REAM FOR DOWEL PINS FOR #10-24 SCREWS
DETAIL DWG. BORING CHUCK DWN. W. DE VETTE
SCALE: FULL SIZE SMALL PARTS DATE FEB. 14, 1921.

SMALL BORING CHUCK

William A. De Vette, Erie, Pa.

THE small boring chuck is the one tool which the machinist, the toolmaker, and even the instructor very seldom has until he takes the time to make one for his own use. In the accompanying drawings I wish to present a chuck which can be given to advanced students in machine shop practice as a shop project and which would be of unusual interest to the students themselves for the reason that they all know they shall need one almost as soon as they leave the school for the commercial shop.

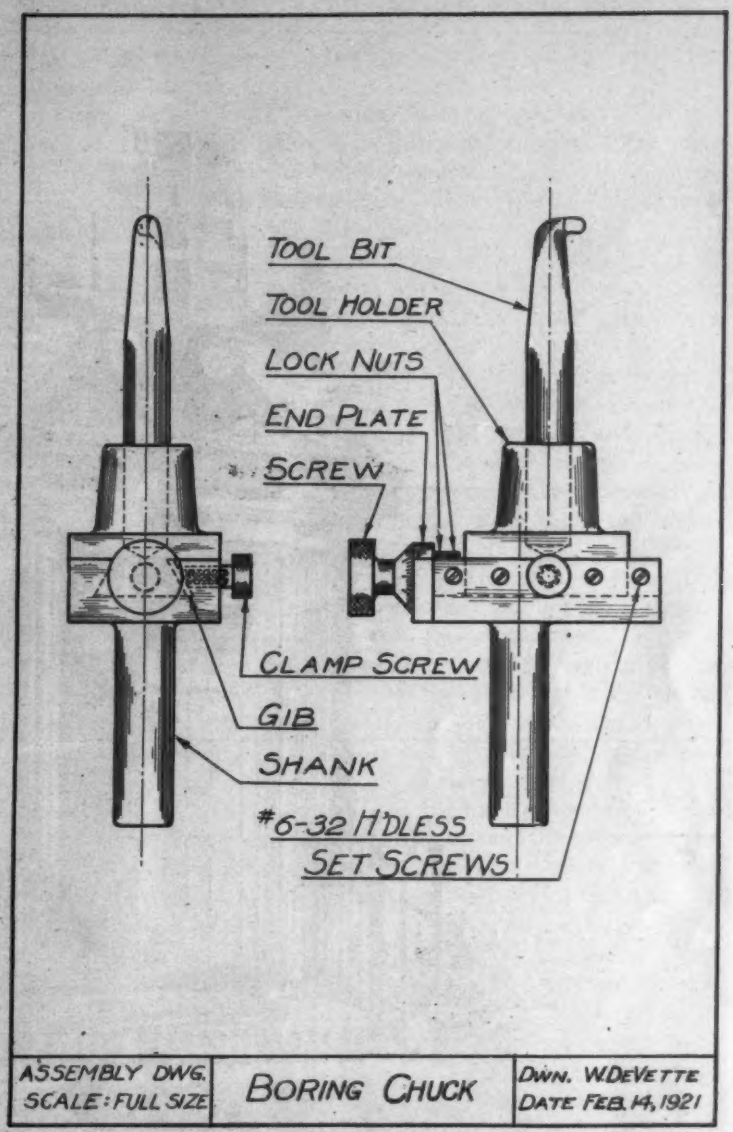
The boring chuck shown in these drawings is so designed as to be very simply and easily constructed by the student, the main parts being the shank with its dovetail slot and the tool holder with its dovetail. The screw with the exception of graduating the dial is a lathe job entirely and the gib is straight.

In designing this chuck especial care has been taken to insure rigidity and consequent accuracy in operation by a dovetail with a gib adjustment for the slide.

The screw has forty threads per inch so that if the dial is graduated into twenty-five parts there will be .001 movement per graduation.

The minimum size of the hole which may be bored with this chuck is limited only by the size of the tool itself which is able to get into it. The dial is in a very open position so that it may be easily read and adjusted. The adjustment is made by loosening the screw at the side, turning the large screw the required number of graduations, corresponding to the thousandths of an inch to be removed at the next cut and then again tightening the small screw at the side. This will insure against all possible movement or backlash of the slide, or tool holder.

If the student's course were so arranged that he could make the drawings for this chuck himself it would aid greatly in familiarizing him with the points of its design before he attempted to commence its actual construction.



A PLAN FOR DESIGNATING PUPILS.

Mr. T. W. McNeill, Instructor of Manual Training at Keyser, W. Va., has worked out a plan for designating students where they come from both the grades and the high school. For every class Mr. McNeill makes out a list somewhat as follows:

Time of recitation.....

Name	Student's No.
Adams, Elmer	1-7-A

The first number in the series indicates the bench where the pupil works. The second number indicates the grade in which the student is enrolled. The letter indicates the class in manual training to which the boy belongs. High school students are indicated by substituting for the second number a letter to show the class to which they belong. Thus F represents freshman, S, sophomore, J, junior, and Z, senior.

The Pine Apple Door, Concord, Mass.

PENCIL SKETCHING

Harry W. Jacobs, Director, Art Education, Buffalo, N. Y.

Part III.

THE first article on pencil sketching was devoted to the materials used and the manner of their handling. Strokes of various character were considered, followed in the second article by the discussion of a general plan of working from the simple parts of a subject, to the completed sketch, applying such fundamental principles as were considered in the first article.

In this article, we will consider the center of interest as an important factor in picture making, as applied to pencil sketching.

As one selects a subject for a sketch, he will practically always find a confusing amount of detail, but within all this detail there is some one chief interest point, which his eye will return to again and again for satisfaction. Our problem is first to select this chief interest point and then to be able, thru study and experimenting with the pencil as a medium, to give a general effect of the detail which surrounds the selected interest point. This is accomplished thru the arrangement of masses and lines which will tend to suggest detail. This pattern of masses and lines will always be subordinated to the interest point, yet be a most important factor in building about our focus point, arrangements, that will lead the eye to this center.

A subject may be composed of many parts, as a gateway, stone steps, building, foliage, fence, road and figures, but these put together upon paper, do not make a picture; and not, indeed, until they have been arranged and composed.

There is no doubt that the finder, a small piece of cardboard, with a rectangular opening cut of good proportions will be of great assistance in finding your picture and determining your interest point. This finder is moved about, until within the opening, framed by the cardboard, is a pattern of line and mass, with a focal center. The camera also offers a view finder, thru which we may arrange the setting of our picture, making a pleasing composition.

In selecting the subject of a sketch, the draughtsman's interest is attracted first by the general setting of the subject; then his interest becomes fixed in one direction, in fact, toward some particular object in the whole subject. Should this subject be of too great proportions to come completely within his focus, he selects some particular part of the whole, which he desires to emphasize as a central interest point in his sketch.

For example, in the three sketches of "The Postern Gate of Moret," three different interest points have been emphasized. In "A," the interest centers about the arch of the gateway, with its dark shadow and silhouetted people against the lighter value of the water. All details are subordinated to this center and all lines and masses are so arranged as to lead the eye to this point.

In "B" the interest is in the upper part of the gateway, all other detail being subordinated. The rough roof, the wall made of hundreds of small stones cemeted in place with the heavy cornerstones as main supports make for interesting pattern.

In "C" the interest is centered to the left of the archway, the doorway of the gatekeeper's house, the big stone gateway being suggested to complete the idea of the home and its connection.

Every sketch involves the selection of a viewpoint, the determination of a center of interest, the location of that center of interest on your paper so as to form a pleasing arrangement, and the adjustment of all lines, values and masses to make evident, to emphasize, to exalt, that center of interest which is the real subject of the sketch.

This may be accomplished in several ways; by placing the center of interest near the center of the picture; by making the lines and masses of such a character as will lead the eye toward the center of interest; by subordinating all masses and lines as they go away from the interest point; by accenting and accentuating all detail at the interest center; and by giving the greatest contrasts of light and dark at the center of interest.

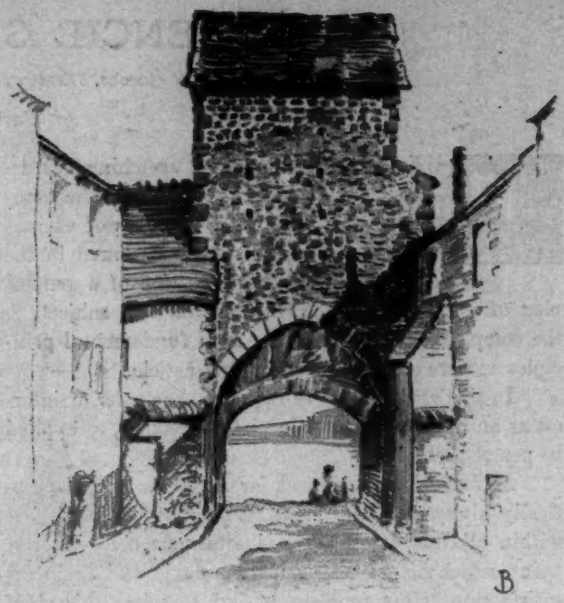
In the sketch of the "Corner Grocery" made in the shadow of Christ Church, Boston, when Paul Revere hung his signal lanterns, I tried to think of a series of zones—by taking a compass and inscribing an imaginery circle with the center of the doorway as a center and the dark of the doorway as a radius. This zone was the center of interest. The next circle or zone inscribed would be to the edge of the barrel, taking in all subordinated masses, while the third circle or zone would extend to the edge of the awnings which would find all masses breaking into line. In other words, our values radiate from the center outward, from dark to light and from mass to line, each zone controlling a value from light to dark and all zones enhancing the central interest point of our sketch.

Every draughtsman must pick and choose and group, thru considerable study, the elements which the sketch is composed of, that the result may be beautiful.

Nature is not always to be taken as she is, but must be continually transferred and moved about that the best compositions will result. The tree may be taller, the dark foliage moved nearer the light colored house to gain the contact desired; the foreground will be transferred into a pattern of lights and darks, removing this and adding that, all enhancing our interest point and rounding out our sketch.

Every sketch must offer an invitation to enter into

A


B

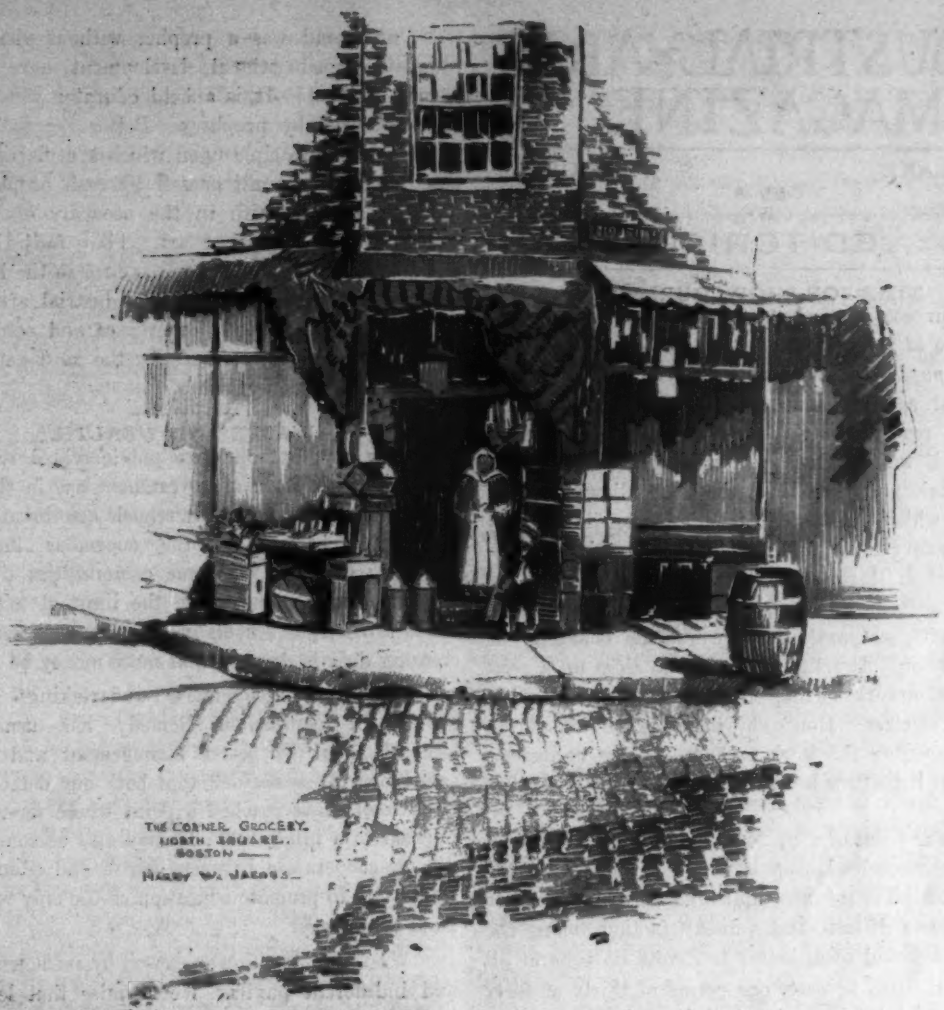
it, some sketches greet you a long way off, by the contrast and arrangement of values. One feels obliged to stop and acknowledge their cordiality. Some admit you thru the side door, and into others you have to climb over a barrier or a lot of useless detail which, ofttimes conceals the central motive and the admirably rendered quality of the sketch.

The sketch of the doorway with the naturalistic treatment of the pineapple finial is a quaint variation from the familiar stiff and strictly conventional Georgian version. This sketch was made at Concord, Massachusetts, which offers wonderful possibilities as a sketching ground with its quaint houses of revolutionary period, its marsh lands and river, with the most beautiful trees and foliage.

With the coming of summer, everyone has a particular hobby, fishing, tramping, boating, etc. But have you ever gone a-sketching? Wandering about in your vacation, carry a pad and pencil. Your material will always be at hand. You will always come upon

C

Photograph of the Old Corner Grocery, North Square, Boston.



the interesting doorway with its purple shadows; the house on the side of the hill with its patches of rock and flowers; the quaint old ship; the old gateway with its excellent bent iron work; and the shaded street with patches of sunlight weaving a wonderful pattern before you. As Hopkinson Smith remarks in his wonderful book on "Outdoor Sketching"—"There are no bounds to the joy of the painter whose north light is the sky, whose studio door is never shut, and who often works surrounded by envious throngs, that treat him with such marked reverence that they whisper one to another for fear of disturbing him."

It is with the greatest interest that you look back over the past year's sketches of the various incidents and happenings, the record that you have made of interesting subjects. With this summer's sketch book, I earnestly hope that you will gain added interest thru these articles and that that interest will lead in each case to the "center of interest" of each sketch.

> We are now so unaccustomed to beauty that we are apt to look upon it as a luxury, and to regard with suspicion those who talk of art; and indeed I began by admitting that much that passes by the name is sheer waste and foolishness. But the art with which we are concerned is nothing more than an intelligent mastery in work done; it is the element of quality in workmanship.—*W. R. Lethaby.*

INDUSTRIAL-ARTS MAGAZINE

E. J. LAKE S. J. VAUGHN
Editors

EDITORIAL

TIME FOR SHOP COURSES.

The purpose of a shop course is *accomplishment*. The nature of it is *activity*. One test of it, *especially from the pupil's point of view*, is *production* in some form. But accomplishment, activity, and production absolutely require *time*. What a failure we invite, therefore, if we introduce courses which demand these fundamentals and then limit the time allowance to a maximum which makes any teacher's success impossible!

Satisfactory shopwork cannot be done in a part-time school in thirty or forty minutes a week. This work differs from other work. It requires preliminary arrangements, preparations of a routine character at each recitation. It takes some time to close up a recitation in shopwork so that the shop may be left ready for the next class. Hence, by the time we deduct the time for opening the work and closing the recitation, there is but little time left for actual constructive activities.

From our point of view, less than two periods a week in a part-time school shop is not only wasted but the very impossibility of accomplishing anything in less time creates a distaste and a dissatisfaction among the pupils. It would seem better to devote no time at all to shopwork than to waste one period of thirty or forty minutes a week in a sort of make-believe shopwork where nothing can be accomplished. Especially is this so among those boys who show neither aptitude nor interest. If the elective plan, which seems so desirable, is properly used, this would seem to eliminate from a particular shop those who show no aptitude or interest.

At any rate, if boys are permitted or required to take shopwork in the part-time school, they should have such a time allowance as would not foredoom the efforts of both teacher and pupils to complete and hopeless failure.

WIDE HORIZONS.

We are reminded of a prophecy which a well meaning friend made to the editors of The Industrial Arts Magazine in its infancy, "The industrial arts is a fine subject for temporary educational discussion and promotion, but the subject will soon be covered and you will run out of material for publication."

The Industrial Arts Magazine is now publishing its tenth volume. Contributions are coming in faster than they can be published and the subject of industrial arts has grown to such proportions in our schools that the editorial problem is one of careful selection to cover a constantly increasing variety of interests.

Our friend was a prophet without vision. Few prophets of educational development have adequate vision. Indeed! It is a bold educator who will risk his reputation by prophecy. Better far to express a conviction of principle upon which speculation may be based than to commit oneself by rash prophecy. We have an abiding faith in the necessity of industrial education and industrial art. That faith is upheld as the years go by so that we are firm in the belief that our problem of promoting the industrial arts in education is a task of vast importance and responsibility which can be performed only by the most generous cooperation of all concerned.

WASTE AND WEALTH.

They say that our free public school system and our democratic form of government are in the experimental stage. Some of our schools are threatened with bankruptcy because of the enormous increase in operating expense. In some communities the schools have reached a point where the limit of taxation has failed to keep the schools in effective condition, and increasing deficits demand that more money be raised.

Most great cooperative undertakings have had periods of depression. Remedy has usually been brought about by better management and more cooperation. It is decided that both our democracy and our schools have reached a point where waste must be reduced to a minimum. It may also be conceded that greater cooperation between wealth and education will find a way to promote education as the only way to promote democracy.

Waste in education is caused by inefficient teachers and indifferent pupils. We surmise that large numbers of boys and girls are going to school as a matter of aimlessly sharing in the birthright of a democracy to which they recognize no obligation, and large numbers of teachers are holding positions for which they are unfitted in training or spirit. The obligation of the pupil to the nation will not be developed by emphasis on the propriety of passing thru a prescribed order of school exercises. Obligation carries with it the desire for service.

One remedy for the waste of aimlessness in school lies in the development of the school as a selective agency. The capacities of pupils may be determined by careful tests. School work should be as carefully applied by the school, according to the capacity of the pupil, as medical aid is applied to physical condition. This is becoming possible as we are learning to apply educational and intelligence tests.

But the substitution of selected instruction for aimless instruction will not cost less in dollars. It will probably cost more. The money for it must be supplied from the only source of wealth. Those who are able must pay the bills. Democracy requires that her citizens have equal chance to develop according to their capacities. Democracy must be generous with the

privileges of service to those who can foot the bills. It should be the privilege of wealth in a wealthy community to foot the school bills in a poor community. State and Federal aid for education have been held up as bogies against democracy, but who is afraid of bogies when education, the very foundation of democracy, is threatened?

OVER-DOING THE OUTLINE, LESSON PLAN, AND RECORDS BUSINESS.

Recently, a teacher of shop work was exhibiting to a visitor the merits of a wonderful new system of lesson blanks, class records, individual reports, etc., etc., which he had worked out. It seemed that no item of procedure, time, material, purpose, result and "things hoped for" had failed to receive its little allotment of space. He had even constructed a beautiful little cabinet in which to keep the elaborate system of which he was so proud.

Then the visitor asked a simple little question, as visitors will do. "And how does your system work in the practical conduct of a class?" "Oh," said the teacher, "I haven't tried it; I am simply too blamed busy to use it!"

The teacher hardly seemed to appreciate the irony of the fact that he had worked out a scheme that would require a private secretary to keep it going. Elaborate pieces of machinery have been known to fly to pieces or to collapse in a useless mass by the sheer force of their own weight and complexity.

Blanks and records and reports and plans and outlines have their places, but when they become so numerous as to occupy a large percentage of the time of both the students and the teachers, they become nothing short of a nuisance. A few simple and brief devices of this kind help to clarify and vitalize the work; but when they constitute almost the sole reliance of the teacher, they become a routine drudgery which crushes the life out of the work.

ART IN THE PART-TIME SCHOOL.

We have looked almost in vain for suggestions as to how art instruction may function in the part-time school. We have noted with some chagrin the quite common disposition to ignore the art work in planning the curriculums for the working boys and girls.

Perhaps no one knows just what should or can be done with the art work in the part-time schools. In this respect, then, it is about on a par with a number of other subjects. Certain it is that the common emphasis on execution cannot meet the needs of this type of school, with its rapidly changing, temporary pupils.

But cannot something be done in the way of appreciation courses that will make the boys and girls more valuable workers and more intelligent, discriminating consumers and home makers? Cannot something be done to make the part-time boys and girls conscious of the fact that the principles of art and design are involved in practically everything they buy, everything they sell, everything they make, everything they wear, everything they eat, and in large measure everything they think? The principles are there whether in observance or in violation. We think they can be made vital, controlling factors in these pupils' lives, if only teachers of vision can get down to their levels and deal in the common, everyday language with the principles of art and design as they affect the common, everyday things in the lives and the environments of the working boys and girls.

This new field presents an opportunity and throws out a challenge to ambitious teachers of art. Let us hope that there are those who will take up the challenge, grasp the opportunity, and do the work that so much needs to be done for the part-time schools.

Influence is the worst handicap any young man can have. It tends to make him feel he need not exert himself to his full capacity and has a bad effect upon him. When other workmen learn that one of their number has a pull with somebody higher up, they look at him askance and the effect upon these other men is bad. Then the foreman, or whoever is over him, will either show him undue favors and push him into a position for which he is not fitted, or, if the boss is of a different stamp, he will hesitate to promote him even when he deserves it because the boss knows the others will think it is a case of favoritism. The effect, therefore, is bad upon the whole organization. When any young engineer or college graduate or anybody else comes to me asking for a letter to enable him to get a job at our works I say to him just what I have said here.—*John D. Ryan.*

Beautiful homes will never result from the assiduous painting of flowers in our school classes. Neither will beautiful homes result from extensive "picture study," as it is called. Pictures have just about as much to do with making our homes beautiful as have books. It is desirable that we know something about the great painters and sculptors of the world, for the same reason that we wish to know something about Shakespeare and Dante. But one might be very familiar with the contents of the great Art galleries of Europe, and still know very little about how to make his home beautiful.—*Hugo B. Froehlich.*

Because of its vital part now, and its promise of still greater prominence in human affairs the production and use of printing offer a challenge for achievement.

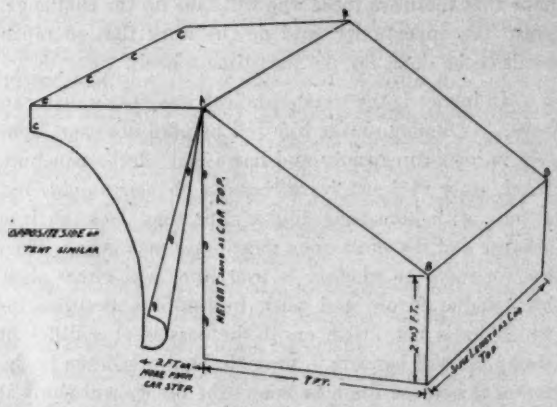
The printer who loves his art, and is zealous for accomplishment, must have a background on the standards of master production. He must endeavor to employ in his own work the sound principles and vast fund of precedents open to him. The multiplicity of present-day requirements, and the almost unlimited range of material, make knowledge and skill imperative for those who would be masters in the Master Art of Typography. —*Henry Lewis Johnson.*

CAMPING WITH AN AUTOMOBILE

Leon A. Orr, Supervisor of Industrial Arts, Burlington, Vt.

For people with a car and limited means there is no way of enjoying one's vacation so much and so economically as to take that car and go on a camping trip. Go anywhere, to the mountains for scenery, fresh air and a change of vision, or to the cities and historical places for the benefits which are to be derived from such associations. We, a party of four, traveled for eleven days in a Ford during which time we covered eleven hundred miles at an expense of fifteen dollars a person. This included two nights at a hotel, or six dollars per night, but did not cover the wear on the car or tire expense.

AUTOMOBILE TENT.



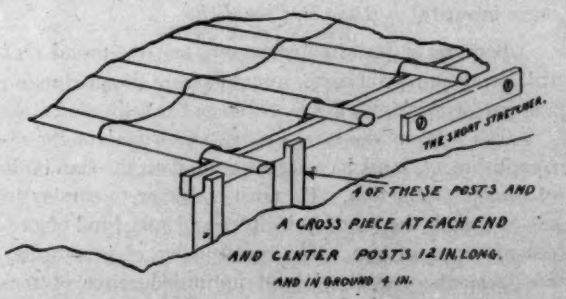
Pole supports at A.A. and B.B. to which rope stays are fastened. C.C.C. ropes fastening to car on opposite side. D.D.D. auto curtain fasteners. At lower corners peg to ground.

The main requisites for such a trip are a tent and cots, both preferably home made, and a camp stove to burn gas generated from gasoline under pressure.

The tent should be one beginning at the top of the car, as wide as the top is long and extending out eight or nine feet. (See the accompanying drawing for particulars.) The whole should be waterproofed with a coating made of one box of paraffine melted and diluted with three times as much gasoline and should be applied quickly with a paint brush before it cools. The poles can be made of bamboo or other light wood in two sections.

The cot is easily made from strips of canvas sewed together, 7 by 7 or 8 feet. (See drawing.) Other strips are sewed on, to take poles as supports, the ends being kept off the ground by posts and cross p'eces.

The stove may cost more than a grate under which to build a fire, but on rainy days or with a scarcity of wood it will more than repay its cost. It is surprising what little room this outfit takes up on a running board and how little it is noticed when covered with black oil cloth.

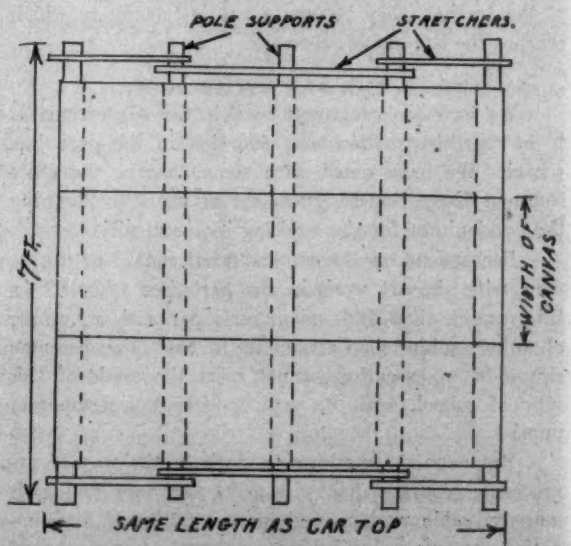


Cot and method of supports. Lower view is minus the stretchers, one of which is shown.

The special trip I spoke of led from Albany, N. Y., thru New York City and Philadelphia to Washington and into Virginia, returning by way of Gettysburg and the Delaware Water Gap. The first night's camp was on the outskirts of Tarrytown in the romantic Sleepy Hollow region and was in an open pasture across the road from Andrew Carnegie's estate. The next night was at a rural schoolhouse in New Jersey. School yards are ideal places, free from long grass and of easy access to the road, and unless posted one need feel no fear of trespassing. If posted, get permission or move on. Once we were ordered off by one party after gaining permission from another, but when explanations were made all was well and we were informed that it would be "a right smart place to camp all right."

Some times we camped with other parties. One night it was a couple from Montana, another night a couple from Ohio and a party of five from western Pennsylvania. Across the Potomac from Washington, on the road to Mt. Vernon and almost within sight of the capitol there is an ideal camping place. Here we spent two nights with a party from Florida.

THE COT.



Dotted lines are 4 inch canvas strips sewed to under side to take pole supports. Pole supports 1½" straight grained maple or ash full length or two piece with ferrule at center or use two lengths of gas pipe joined.

The quaint Pennsylvania Dutch towns were very picturesque and pleasing. One very rainy night was spent at a two-hundred-year old hotel in Gauglersville among the quaintest of the Dutch where a pail was a "bucket" and a faucet a "spigot" and the cook stoves of the homes were shut up in cupboards to make living rooms of the kitchens.

In fact, many and varied are the sensations and experiences encountered and everyone is willing to meet you half way if approached carefully and pleasantly and as a fellow being in their own sphere of life. In fact, we had offers to use front and side lawns as camping grounds and one neighbor, on a Sunday, baked a pan of biscuits for us.

In conclusion, do not hurry yourselves to death. An average of a hunded miles a day is sufficient if you would see everything. Lay up over Sunday and rest for a new start. Stop for a swim in a lake or to catch some fish and you will return home refreshed and rested and intent on another trip as soon as possible.

TRADE COURSES IN OKLAHOMA.

Henry F. Holtzclaw, Supervisor, Trade and Industrial Education.

Since the year 1903 the Oklahoma Agricultural and Mechanical College at Stillwater, has offered four-year courses of college rank to those desiring to specialize in some line of vocational education.

Realizing the need of offering training of less than college grade in the trades and industries and thru the aid of state and federal funds the college now offers practical trade courses in automobile mechanics, cabinet making, carpentry and machine shop practice.

At the present time 34 students are enrolled in the two-year course in automobile mechanics and nine are enrolled in the two-year course in machine shop practice. These courses are less than college grade and are open to boys over 14 years of age who are at least eighth grade graduates.

The courses are practical and the graduates are to be awarded certificates recommending the holder thereof to any employer with the statement that he has completed the two-year course in automobile mechanics and machine shop work and expressing the opinion that the graduate, after reasonable experience, will become a skilled and efficient workman. Each student enrolled in the courses given, is required to work sixteen hours per week in the shops, six hours per week in applied science, four hours per week in mechanical drawing and in addition to this instruction, to take one elective course in either English, physical education or citizenship. In the first-year courses the elective is generally a physical education, and in the second year courses, English and citizenship is recommended.

The entire engineering plant of the College, including mechanical, civil, chemical and architectural engineering departments, is available for the students enrolled in the trades and industrial courses. Forge and machine shops, woodworking shops, the college power plant and the well equipped mechanical and electrical laboratories offer a rare opportunity for study.

The College owns a well equipped garage and among the equipment is six automobiles and twelve automobile engines. The students not only take down and assemble automobiles, repair broken parts, and study the various theories of design, but are also skilled in magneto, starting, ignition, lighting, carburetor adjustment and study of soldering, brazing and oxy-acetylene.

Students in machine shop practice are required to make drawings of machines, both detailed and assembled, the use of the lathe, shaper and planer, tool-making, involving the use of milling machines and grinders and the heat treatment of steel in annealing and casehardening. The manufacturing of one hundred and fifty nut crackers, several glue presses and turning lathes for woodwork served as productive projects used to give practical training in machine shop work during the first semester course which ended January, 1921.

MAKE YOUR INDUSTRIAL-ARTS MAGAZINE ONE HUNDRED PER CENT EFFICIENT.

Harold J. Van Westrienen, Royal Oak, Mich.

I have been a reader of the INDUSTRIAL-ARTS MAGAZINE for the past three or four years, and although I have been receiving many helpful suggestions, I realized that after their being read and laid away the copies at once lost their usefulness. After considerable thought on the question of cataloging the material for future reference work, I decided on the following plan.

My first step was to divide the topics under different heads, so as to enable me to locate the desired information with the least possible effort. This I did after assembling, sorting, and eliminating all possibilities. The list I submit may be altered to suit the individual needs of the reader, but the following covers nearly all the material contained in the magazine and I find it very efficient.

1. Automobiles (courses of study, repair, etc.).
2. Baskets and weaving.
3. Book binding and paper work.
4. Cloths, weaving and leather work.
5. Clay modeling and pottery.
6. Concrete work.
7. Commercial lettering and sign painting.
8. Electrical apparatus, telegraph, etc.
9. Machine shop and forge shops.
10. Metal work (art and sheet).
11. Mechanical drawing teaching kinks.
12. Pattern making and foundry.
13. Printing.

Wood Work Projects:

14. Involving squaring stock.
15. Involving squaring and chamfering.
16. Involving squaring, chamfering and boring.
17. Involving half-lap joints.
18. Involving mortise and tenon joints.
19. Involving coping saw work.
20. Involving turning saw work.
21. Tables and benches.
22. Cabinets (sewing, cooking and filing).
23. Farm woodwork.
24. Athletic apparatus.
25. Wood turning.
26. Wood finishing.
27. Teaching woodwork (kinks and jigs).
28. General topics along educational lines.

As the reader finds a worth while article it should be recorded at once under the proper heading, for example as follows:

24. ATHLETIC APPARATUS.

TOPIC	PAGE	MONTH	YEAR
Playground Slide	320	August	1918
Toboggan	453	November	1920
Etc.			

27. TEACHING WOODWORK, KINKS & JIGS

TOPIC	PAGE	MONTH	YEAR
Course in 1st Eight Grades	1	January	1919
Makeshift Jig Saw	287	July	1919
Points on Wood Joints	15	January	1920
Etc.			

By recording all valuable material in the above manner in a notebook form, a wealth of valuable information is at hand for instant reference, while hours could be spent in vain looking for the desired material under the old "Throw on the Shelf" method.

The time required to keep this catalog up to date is very small, and well repaid by the value received in future reference. Bind your numbers in yearly volumes, catalog them, and make your copies of the INDUSTRIAL-ARTS MAGAZINE one hundred per cent efficient.

VOCATIONAL EDUCATION IN THE GARMENT TRADES AT LOS ANGELES.

"Maquina de coser, sewing machine. Obra, work. Vestido, dress." And then when Inez or Consuella or Francesca have done particularly good work the instructor says Bien hecho! Well done.

The Spanish words with English translations on the blackboard in the power sewing machine school in Los Angeles, California, are little lessons in Americanization which Mrs. W. S. Kienholtz, the vocational education teacher is giving her twenty pupils "between garments."

In July the schools and the garment manufacturers evolved a plan to teach hundreds of girls and women who need immediate employment a trade at which they may earn a decent living. The state laws of California require manufacturers and employers in every occupation to pay women workers a minimum wage of $16.50 a week.

A VOCATIONAL CLASS IN A LOS ANGELES GARMENT SHOP.

To make employes worth their wages is what the manufacturers wanted from the school and to make better citizens of the pupils in training is what the educational department of the city desired. The idea of putting together the demand and supply originated in the vocational department of the Chamber of Commerce which has an industrial department and a committee on vocational and educational affairs. In conference with W. S. Kienholtz, head of the Los Angeles' vocational training in the city schools the practical scheme for teaching women a trade in from two to eight weeks was effected thru the cooperation of schools, employers and the Chamber.

Over $800 was raised by the Associated Apparel Manufacturers to purchase 20 power sewing machines which are full almost every hour, altho the state school laws permit only a half day to be spent in vocational training. At the end of the course pupils are given a certificate of proficiency and permitted to seek employment. Over 100 pupils have been placed since July and over 200 have enrolled in the school. Employers are satisfied with the workers turned out and even take some of the pupils from the school before they have completed a full course, saying that they are willing to take them and pay wages while they are still apprentices.

Other employers have sent workers to the school on the promise that they should be re-employed at higher wages when they become more proficient.

Garments are supplied by clothing manufacturers for stitching and all the County Hospital clothing is sewed by the apprentices. Over 25,000 aprons, rompers, pajamas, kimonas, bloomers, surgeons' operating gowns, intern coats and shirts have been stitched in three months.

"The manufacturers are anxious to send their material because we have established a reputation for never spoiling things," Mrs. Kienholtz said proudly, as a messenger from a local concern entered the room with a pile of twelve dozen shirts, the second "batch" of goods brought within the month.

Mrs. Kienholtz' success with her pupils is due to her careful overseeing and her past experience as forewoman in a garment factory in Minneapolis. Her tact and good nature make the little Mexican girl sitting in the corner quite at ease in her strange new surroundings. Foreigners who are unfamiliar with factory regulations, which require clean hands and neat clothing for workers who expect to receive steady employment, are told in Spanish words the meaning of the American, the very American hygiene.

When Juan comes to school with a bad cold Mrs. Kienholtz sends him home and tells him what the Americans do to cure bad colds.

Altho most of the pupils in the trade school are women, men occasionally apply for entrance. At present a young Italian barber is learning to become a tailor between shaves and the mother of a growing son is going to become a garment maker so that the boy can finish high school. Another woman, the mother of a baby girl and an invalid husband is going to keep the household out of the charity bureau because in two weeks she learned how to run a power sewing machine and is now earning over $25 a week in a dressmaker's establishment.

Beginners earn on the average $24 a week, but piece work sometimes brings in as much as $40 or $50 a week to experienced operatives, Mrs. Kienholtz says.

"This free school of course attracts all types. But of course we can't train everyone. We eliminate those who are too nervous or too set in their ways of basting and pinning and pinning and basting, because we know that an unadaptable dressmaker will never be able to make good in a factory," Mrs. Kienholtz explained as she sorted out piles of cut garments for stitching.

Some of the samples made by the forewoman of a factory are not 50 per cent as well made as the garments turned out by [illegible] training, employers and instructo[illegible]

The painters of Los Angeles need skilled laborers and when they heard of the success of the garment making school one concern told the Chamber of Commerce that it would supply all the paints, brushes, buckets and wood for a master painters' school. Three times a night old hands as well as new apprentices at painting, gather in the public school to learn interior decorating, wood finishing or even English and some commercial subject taught by regular public school instructors.

Laundrymen have watched the progress of both schools and recently conferred with vocational education committeemen in the Chamber and the director of vocation training in the schools to see how the interests of employes in laundries and the employers can be better served thru formal instruction. In two weeks the largest laundry in Los Angeles will be turned into a school before working hours and after the regular business day.

This practical use of industrial plants and schools has been decided upon as the best course in establishing the trade school idea rather than building a million-dollar-plant for trade pupils alone, as has been suggested by a number of visionaries. But if the trade school idea progresses as rapidly as it bids fair to do, Los Angeles may be the site of the proposed temple of trade before the conservatives are convinced.

TRAINING OF APPRENTICE PLUMBERS IN ERIE, PA.

A working agreement on training of apprentices in public night schools has been signed by representatives of Erie Master Plumbers' Club and Local Union Number 333. By the terms of this agreement both employer and union require of all registered apprentices that they attend the classes in mathematics for plumbers and in sketching and plan reading which opened October 18.

This step is the direct outcome of a growing realization by union officials and employers of the duties they owe to the apprentices under their charge and to the public. Due to the modern development of the trade, apprentices may fail to acquire in their term of apprenticeship all the branches of the craft. Hence masters and men alike thought it desirable to set up such training as would make sure that each apprentice when he has completed his term of service would be able to render competent service as a journeyman.

To insure that the apprentices attend the instruction set up by the public night schools, the local union has ruled that no apprentice's quarterly card will be renewed unless he presents evidence of satisfactory attendance and progress at school. The working agreement entered into on September second, 1920, between the local union and the employers specifies in section 18 that the apprentice "must agree to attend night school classes for plumbing, that are to be arranged for by the school district of the City of Erie and by the journeymen and master plumbers of the same city."

The memorandum appended to this article was drawn up by E. W. Barry, business agent of Local No. 333, G. W. Butler, secretary of the Master Plumbers' Club, and E. L. Bowman, Director of Vocational Education for the city schools. It was at once adopted by the trade bodies and submitted to the school board for approval.

This form of agreement is contemplated by the Showalter Act of May 1, 1913, which provides (Section 3411, revised school laws of Pensylvania) that "local school boards may appoint an advisory committee composed of members representing local trades, industries, and occupations. It shall be the duty of such committee to counsel with and advise the local board of trustees and other school officials having the management and supervision of such schools."

It will be noted that the memorandum contemplated the gradual instruction of the work. The classes are open to journeymen as well as apprentices, and many journeymen are taking advantage of the work thus offered.

No texts were available for the classes. Mr. Frank Flowers instructor in plumbers' mathematics, has assisted Vocational Director E. L. Bowman in the preparation of a mimeographed text which thus far has met the needs of the men. Mr. G. Wesley Stickle, a local architect and instructor in sketching, is working out the details of a text in his subject.

Following is a copy of the memorandum:

Memorandum of Agreement for the Plumbers' Trade.

Memorandum of agreement covering courses for plumbers' apprentices and journeymen in the Erie Public Schools for the year 1920-21.

I. The School District of the City of Erie agrees:

1. That free evening classes will be opened to apprentice and journeymen plumbers as follows:

1920-21—

Mathematics for plumbers—one two-hour class.
Drafting for plumbers—one two-hour class.

BIRDHOUSE AND POSTER EXHIBIT, DIXON, ILL.

This is a portion of a birdhouse and poster exhibit of the Dixon, Illinois, schools, held at the Dixon public library, March 18-19. Local clubs and merchants contributed prizes in the form of bird books and other articles which boys would prize. A great deal of interest was manifested on the part of local people as well as on the parts of boys and girls. This exhibit includes only work of the sixth and seventh grades in manual training, under the direction of Mr. [illegible] Marty Phillips, and of the seventh and eighth grades in drawing under the direction of Miss Ella Kentner.

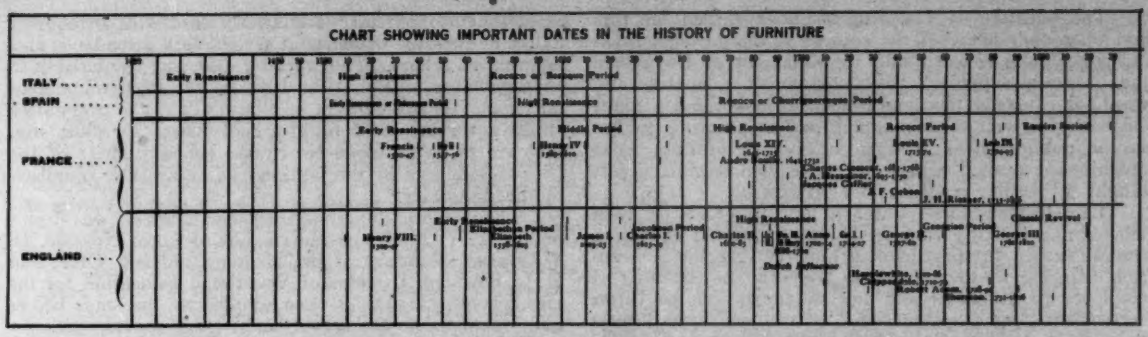


CHART OF DATES IN FURNITURE HISTORY. COMPILED BY THE PHILADELPHIA MUSEUM OF INDUSTRIAL ART.

1921-22—
Advanced mathematics for plumbers.
Advanced drafting of plumbing layouts.
1922-23—
Principles of plumbing: practice and theory of sanitary plumbing—two hours
Plumbing practice, shopwork instruction in parts of the trade in which insufficient practice occurs—two hours.
1923-24—
Study of the plumbing code—two hours.
Advanced shopwork in plumbing—two hours.

2. That the above designated classes will begin in October and will continue thruout the winter, for not less than 30 weeks of two nights each, provided the average attendance for any month does not fall below ten in any class.

3. That a certificate showing attendance and progress will be awarded students completing any short unit course in the above classes.

4. That the diploma of the evening schools in the plumbers' trade extension course will be awarded students completing the four-year course as outlined above, said diploma to be countersigned by the secretaries of the plumbers' local and the master plumbers' association.

5. That an advisory committee of two representatives of the master plumbers' association and two representatives of the plumbers' local will be appointed by the board of directors of the school district of the city of Erie from lists of not less than four nominations from each of the bodies mentioned. The director of vocational education shall be a member exofficio of this advisory committee.

6. That the school authorities aided by the advice and recommendations of the advisory committee will standardize the entrance requirements, equipment, course of study, methods of instruction, testing of students, etc., and the graduation of the pupils.

II. The Master Plumbers' Association of the city of Erie agree:

1. That they will nominate from their membership not less than four candidates for the advisory committee as specified in I, 5 above.

2. That no member of the association, after date of this agreement, indenture an apprentice unless said apprentice agrees to attend the trade extension classes outlined in I, 1 above, for not less than 80 per cent of the time such courses are open each year.

3. That no member of the association will continue to employ apprentices unless said apprentices attend the trade extension classes as outlined in Section I, 1 above, for not less than 80 per cent of the time the classes are open.

4. That the master plumbers' association and its members will give such assistance as is possible to the trade extension classes outlined in this agreement; that they will do everything in their power to assist in securing equipment and teaching materials.

III. The officers and members of the plumbers' local No. .. agree:

1. That they will nominate from their membership not less than four candidates for the advisory committee as specified in I, 5 above.

2. That they will require all apprentices registered with them to attend the trade extension classes outlined above for not less than 80 per cent of the time such classes are open, and will refuse to issue quarterly cards to all apprentices not attending classes as specified.

3. That the plumbers' local and its members will give such assistance as is possible to the trade extension classes outlined in this agreement; that they will do everything in their power to assist in securing equipment and teaching materials.

WESTERN ARTS ASSOCIATION.

The twenty-seventh meeting of the Western Arts Association held at Peoria, Illinois, May third to the seventh, was evident of a reviving interest in this organization which has sustained the Industrial Arts of the Central States.

A substantial program, an excellent exhibit and a fair registration marked the annual meeting as the beginning of a revival to pre-war strength and usefulness. The general sessions were held in the Assembly Hall of Bradley Institute.

The exhibits were displayed in the gymnasium building and represented work from important schools and cities of the country, arranged in attractive and convenient manner.

Outstanding features of the program were addresses on the Manual and Industrial Arts by Dr. C. A. Prosser, Director of Dunwoody Institute and discussion of the exhibits led by Dudley Crafts Watson, Director of the Milwaukee Art Institute.

Cincinnati was selected as the place of meeting for next year.

Carl T. Cotter, Director of Manual Training, Toledo, Ohio, was elected President; Mabel Williams, Supervisor of Art, Oak Park, Illinois, was elected vice-president; L. R. Abbott, Grand Rapids, Michigan, was re-elected secretary; Frances Masore, Boone, Iowa, was elected auditor; Ruth Raymond, Minneapolis, Minn., was made a member of the Council; S. J. Vaughn was appointed Chairman of the Council.

CONTINUATION TEACHERS HOLD MEETING.

United support of the work of the continuation schools by the judges charged with the enforcement of the compulsory attendance laws of New York City was pledged at the regular luncheon meeting of the Continuation Teachers' Association held on Saturday, April 9th, at the Cafe Boulevard. It was emphasized that united support of the work by the schools, the attendance bureau and the judges should work to the best interests of the pupils and prove a tremendous force for Americanization.

Mr. George H. Chatfield, assistant director of attendance, expressed the opinion that the schools and the attendance bureau are especially fortunate in the type of men on the bench who are responsible for the enforcement of the law.

Following Mr. Chatfield, Dr. Franklin J. Keller, president of the association, expressed the hearty appreciation which the teachers feel for the fine cooperation of the courts and the attendance bureau. He pointed out that it was the ideal of every teacher to make the continuation schools so valuable and attractive in the lives of young workers that the service of neither the courts nor the bureau will be necessary to bring them to school.

PROBLEMS AND PROJECTS

The Department of Problems and Projects aims to present each month a wide variety of class and shop projects in the Industrial Arts. Successful problems are invited and will be paid for. A brief description of constructed problems, not exceeding 250 words in length, should be accompanied by a good working drawing. The originals of the problems in drawing and design should be sent.

Problems in benchwork, machine shop practice, turning, patternmaking, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work, and other lines of industrial-arts work are desired for consideration. The editors will not accept the old hackneyed problems of footstools, taborets, towel holders, etc., which have been made from time immemorial, ad nauseum.

Drawings and manuscripts should be addressed: The Editors, INDUSTRIAL-ARTS MAGAZINE, Milwaukee, Wis.

TURNING PROBLEMS.

Emil F. Kronquist, Milwaukee, Wis.

Floor Lamps.

I find that the best way to start a piece of work of this nature is to ask the boy to look thru magazines, journals or newspapers, go to furniture stores to gather information about lamps, then to buy five cents' worth of wrapping paper in a hardware store and begin making the preliminary design full size. Boards from the lumber room are used as drawing boards. Care must be exercised in getting all proportions and shapes right and pleasing.

When the preliminary sketches have taken the right shape a finished drawing is made on a clean piece of paper, using a soft pencil and shading the drawing in order to set it off. "Crayola" is preferable to a soft pencil as it does not smear.

All the round lamps are designed with no portion longer than 36", that being the distance between centers of our lathes.

Before stock is glued up, rabbet out, or cut on circular saw, a groove about ¼" square to take care of the wiring when finished. It is, of course, necessary to plug the ends of stock temporarily to provide centers while turning.

Drill holes necessary to assemble different parts of the lamp, fastening work in a horizontal position in the vise and have a fellow student watching at some distance to insure straight drilling. The base is turned on the outside screw of the lathe.

The lamps with octagonal sections are somewhat easier to make if care is taken in laying out the octagons in either ends from exact centers, then jointing to size.

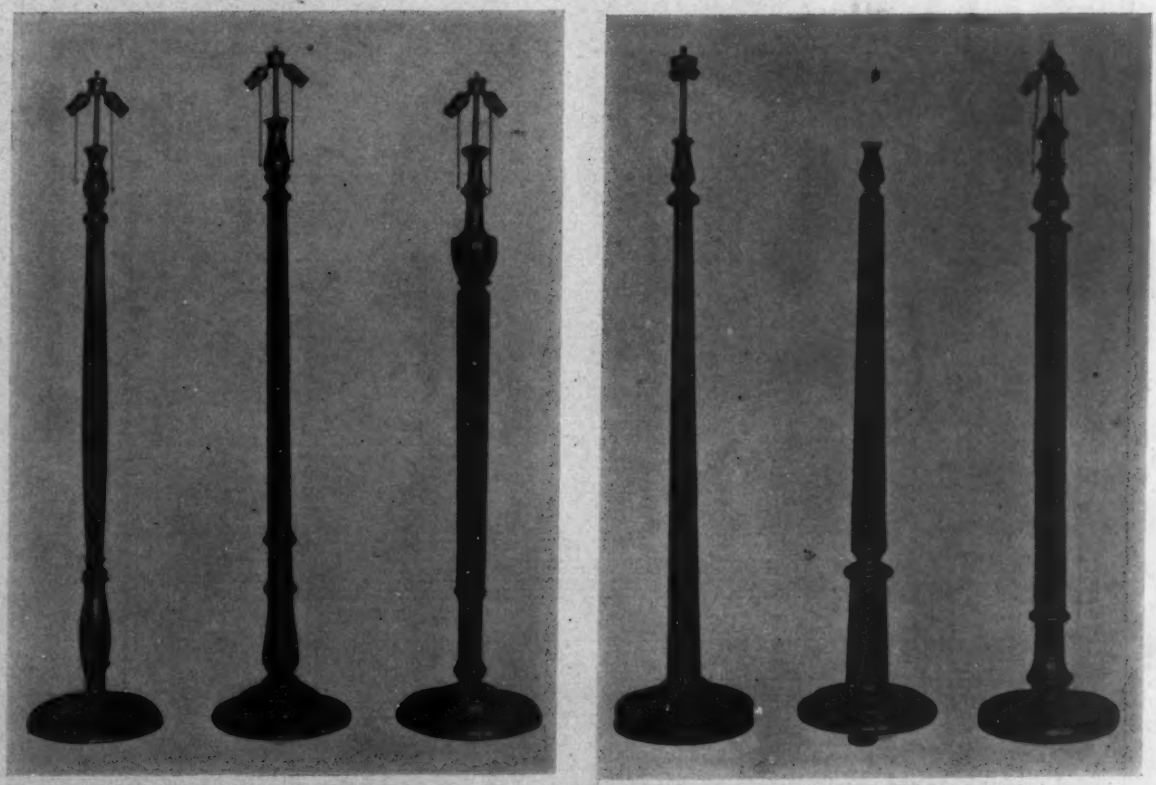
Finishing.

Most of the lamps were made either of gum or birch and finished in mahogany. We have had some splendid results by using mahogany acid stain on the birch, two coats of orange shellac, then two coats of varnish. Each coat was rubbed down with fine sandpaper or steel wool. If the latter is used, be very careful that all the small particles of steel are removed before the next coat is applied. The last coat of varnish should be rubbed down with pumice and oil for an egg shell finish; if a high gloss is wanted, use rotten stone and water followed by a furniture polish such as o'cedar oil or liquid veneer. For a mahogany finish on gum we have used an oil stain, allowing 24 hours before the first coat of shellac was applied.

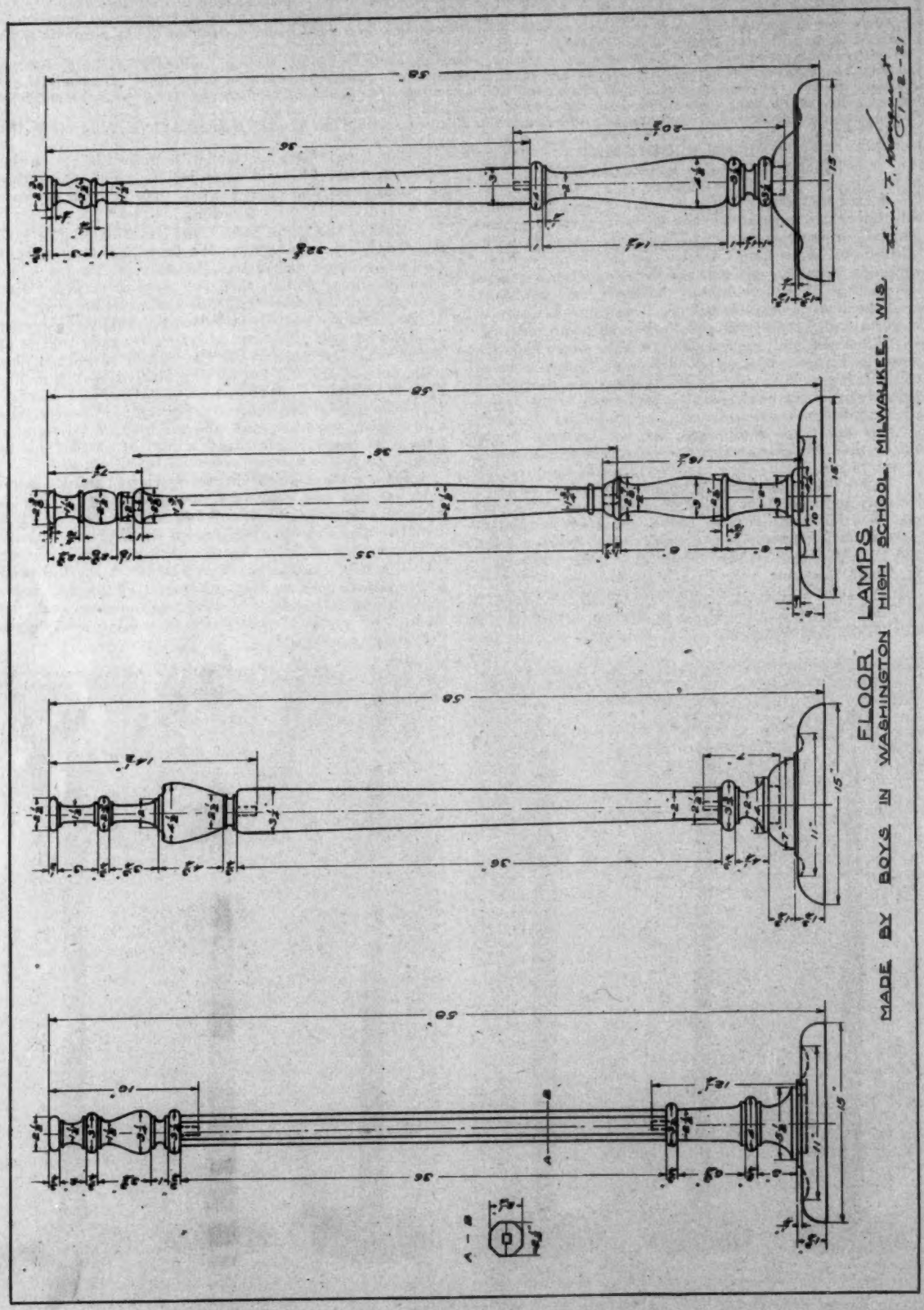
For a walnut finish on gum we do not think a better color can be had than the one gotten by Walter K. Schmidt's Standard Walnut water stain.

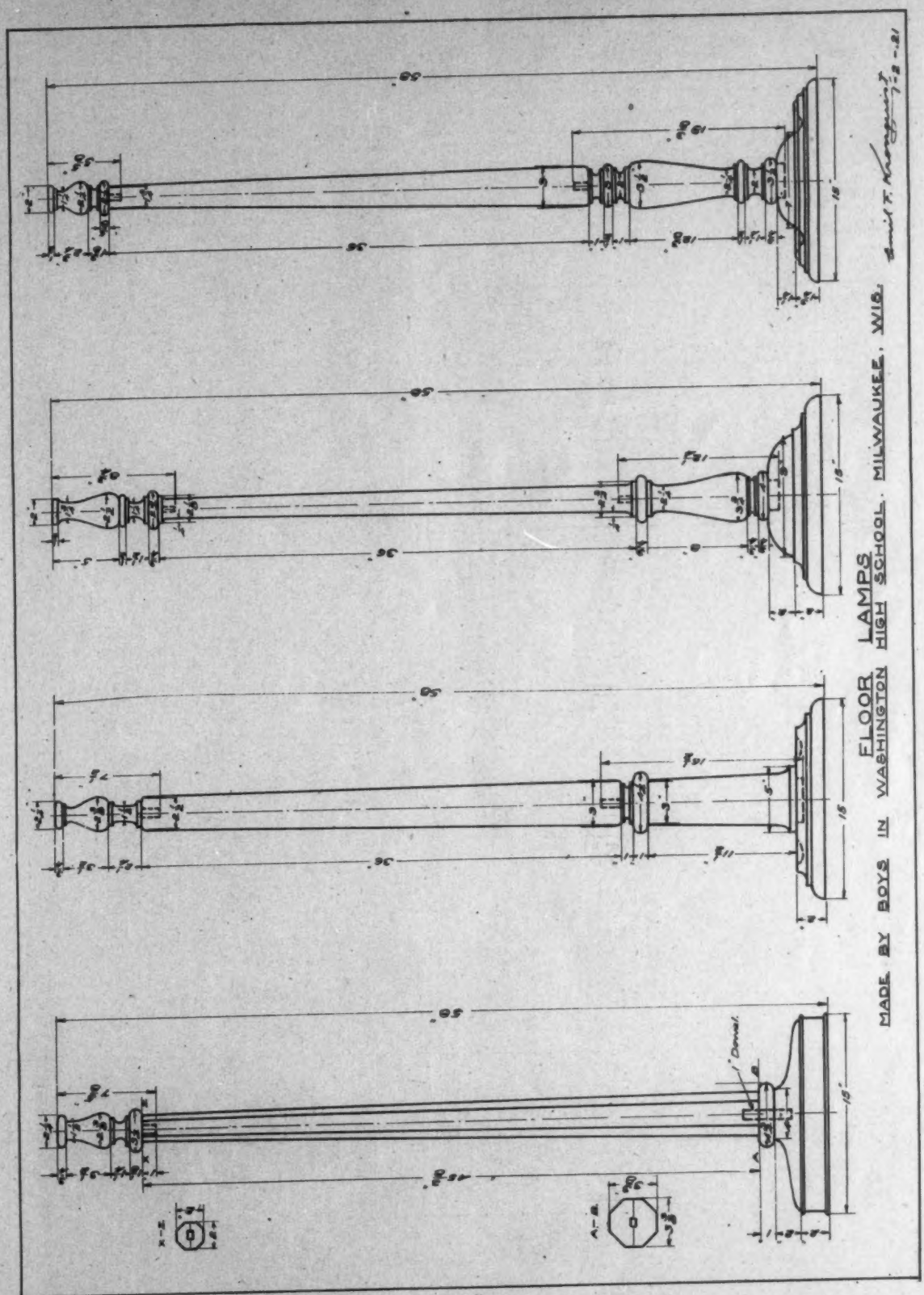
The lamps shown all require a shade of 28" diameter or larger.

The lamps mentioned were started at the beginning of the school year in September and all finished before the Christmas holidays, working 45 minutes each day. About one-fourth of the time was spent in making the drawing.



FLOOR LAMPS DESIGNED AND MADE BY THE AUTHOR'S STUDENTS AT THE WASHINGTON HIGH SCHOOL, MILWAUKEE, WIS.

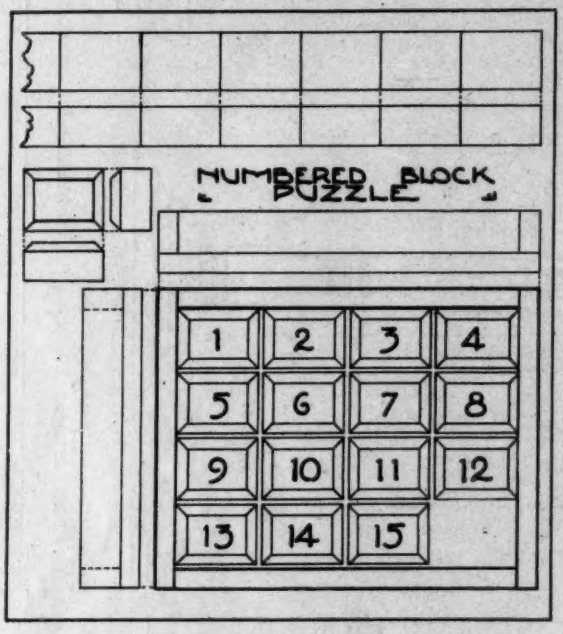

FLOOR LAMPS
MADE BY BOYS IN WASHINGTON HIGH SCHOOL, MILWAUKEE, WIS.


FLOOR LAMPS
MADE BY BOYS IN WASHINGTON HIGH SCHOOL, MILWAUKEE, WIS.
Dowel

NUMBERED BLOCK PUZZLE.

C. Edward Newell, Springfield, Mass.

Simple construction in wood, involving the repetition of the same or similar exercises will furnish a means of excellent hand training. Such training is to be had in making a numbered block puzzle. The sawing and sanding of the fifteen blocks gives training in the use of large muscles. Judgment must be exercised in sanding the bevels and a source of balance developed when locating and pasting the numerals in position. In order to train either classes or individuals in matters of judgment it is well to first prepare the fifteen blocks; place them in position; three rows of four blocks and one row of three blocks; measure the complete unit, calculate the amount of "play" needed around the blocks and decide what the



DETAILS OF BLOCK PUZZLE.

inside dimensions of the tray shall be. To this may be added the thickness of the rails, thus obtaining the outside dimensions of the tray.

The following materials are needed to make a number game; one piece of soft wood preferably pine or bass wood $\frac{1}{4}$"x3$\frac{3}{4}$"x4$\frac{3}{4}$"; one piece of wood $\frac{1}{4}$"x$\frac{1}{2}$"x18"; one piece of wood $\frac{1}{2}$"x$\frac{3}{4}$"x18"; twelve wire nails $\frac{5}{8}$" No. 19; small consecutive numerals 1 to 15 each numeral about $\frac{1}{2}$"x$\frac{3}{4}$" in size.

The wood may be ordered from a mill or from a school shop. The clear stock may be procured from packing boxes as suggested in the article on the air plane is quite satisfactory. Wire nails should be purchased at the general store or hardware dealers in order to be sure of the size wire. The numerals may be set up and printed for this particular purpose in a school print shop or they may readily be procured from one discarded calendar page.

Numeral Blocks: Measure and saw the $\frac{1}{4}$"x$\frac{3}{4}$"x18" wood into 1" lengths. Use the miter box and back saw or a coping saw for this work. The former is preferable. Using about a No. 1$\frac{1}{2}$ sandpaper, sand each $\frac{1}{4}$"x$\frac{3}{4}$"x1" block on the ends and on four edges of one $\frac{3}{4}$"x1" face to make a $\frac{1}{8}$", 45 degrees bevel. Cut the numerals into uniform size papers and paste one paper on the top of each block, long diameters of paper and blocks parallel. From among the blocks cut and sanded the best fifteen may be used for the game.

Tray: Measure and saw the 18" rail to make two pieces $\frac{1}{4}$"x$\frac{1}{2}$"x3$\frac{3}{4}$" and two pieces $\frac{1}{4}$"x$\frac{1}{2}$"x4$\frac{1}{4}$". On the floor for the tray, wood $\frac{1}{4}$"x3$\frac{3}{4}$"x4$\frac{3}{4}$" draw lines $\frac{1}{4}$" from and parallel to all four edges. Within each of these $\frac{1}{4}$" spaces place points for two nails, place $\frac{5}{8}$" No. 19 nails on points and drive them part way thru the $\frac{1}{4}$" wood. Lay the floor on the $\frac{1}{4}$" edge of one 3$\frac{3}{4}$" rail with long edges flush and ends even. Drive the nails part way into the rail, see that all is square and drive the two nails home. Nail the floor to the second 3$\frac{3}{4}$" rail. Nail the floor to one 4$\frac{1}{4}$" rail placed between the ends of the 3$\frac{3}{4}$" rails. Nail the floor to the second 3$\frac{3}{4}$" piece. Nail the ends of the 3$\frac{3}{4}$" pieces to the ends of the 4$\frac{1}{4}$" rails, one nail in each piece.

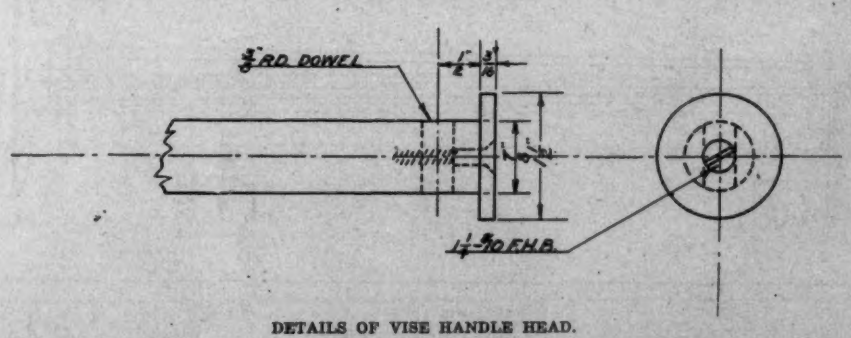
How to Play the Game: Fit the numeral blocks in the tray with the long diameters of the blocks parallel to the long diameter of the tray. A space for one block will be left vacant. Slide the blocks to the right or left, up or down in the tray to get them into consecutive order; 1, 2, 3, 4,—5, 6, 7, 8,—9, 10, 11, 12,—13, 14, 15. It is unfair to lift a block out of the tray. Since the numeral blocks are fitted into the tray in a different order at each game it is next to impossible to give any exact instructions for playing the game. It is a revival of a very old and amusing pastime, one that is quite absorbing and amusing for travelers, the lonesome, the convalescent and the stunt-loving youngster.

A VISE HANDLE HEAD.

A. R. Mitchell, Madison, Wis.

No school shop is complete without a set of first-class vises and a good vise requires a good handle. However, there are few shops that have a complete set of vise handles which are entirely satisfactory, unless the equipment includes vises with stationary iron handles.

My experience with vise handles led me to devise a head, as per sketch, which has proven very satisfactory, simple to make and lasting. The 1$\frac{1}{2}$" disks can be cut out of discarded belting (leather being preferable) or from the heaviest packing rubber used by steamfitters. These disks can be laid out with a pair of dividers and the holes for the screws bored before the disks are cut out to shape. They are easily cut with a sharp knife. The purpose of the dowel is to give a better "grip" for the screw threads.



DETAILS OF VISE HANDLE HEAD.

COMBINATION STEP-LADDER AND KITCHEN STOOL.

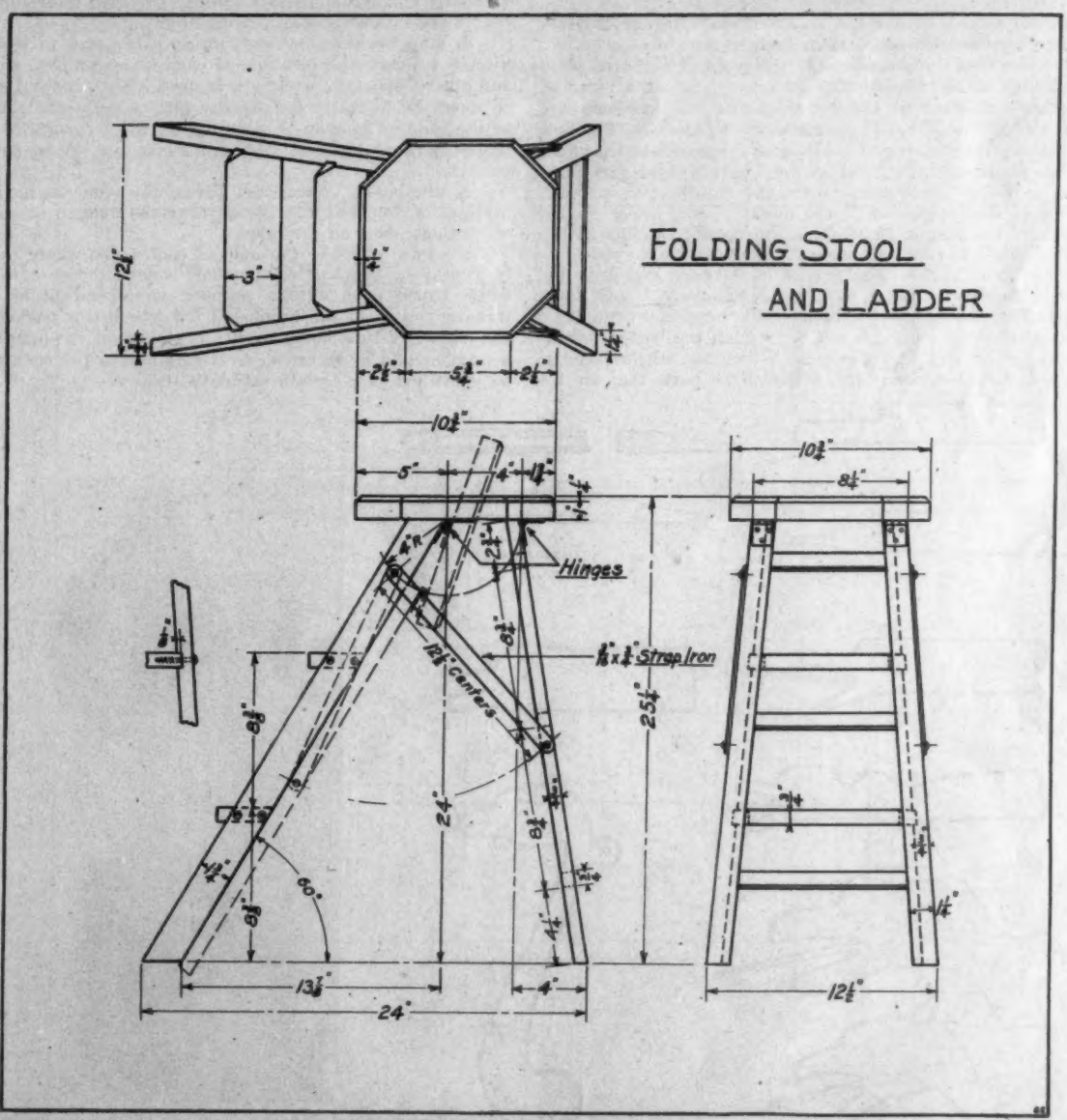
H. H. Braucher, Emporia, Kans.

The accompanying illustration and drawing show the combination ladder and stool open, closed and in the working drawing so that any boy who can follow a blueprint should be able to work out the problem in the shop.

The project is very convenient as a household ladder and stool, being easily folded and stored when not in use. In construction it is difficult enough to challenge the interest of an intelligent boy, involving as it does the laying out of numerous angles and gaines, applying in very characteristic manner the use of the steel square or the bevel or both.

In locating the pivots for the braces the use of drafting may well be brought into play for determining the points so the stool will close or fold easily and without undue strain on the bearings. By studying the points in revolution on the drawings it may be readily shown that the ends of the braces must bear definite relations to the hinges to move freely from one position to the other. If he is allowed to try to get the points by trial first and then

THE STOOL-LADDER OPENED AND FOLDED.



DETAILS OF FOLDING KITCHEN STOOL AND LADDER.

shown how they may be determined in the drafting room, I have found it effective in impressing the boy with the real value of drafting for the determination of such points before wasting time and perhaps material in a vain effort to work it out by trial and failure.

To one who has worked with such problems it is evident that the pivots must be in the arcs of circles about the points acting as centers of revolution, namely the hinges. The upper point is as far from the center of the adjacent hinge as the centers of the hinges are from each other.

The other pivot is easily obtained by cutting the center line of the other leg using the brace as a radius. It may be pointed out, also, that the sum of one long and one short side of the irregular quadrangle must be equal to the sum of the other sides, if the quadrangle is to close flat without straining the joints.

WROUGHT IRON DOOR KNOCKERS.

Thos. F. Googerty, Pontiac, Ill.

Door knockers somewhat like those shown in the illustrations can be made in the school forge shop if one understands a little about forging and using chisels on wrought iron.

Boys who have some knowledge of forging will become very much interested in such work.

The first thing to do is to make a full size free hand drawing of the front and side views. Select a piece of square soft steel of the desired size. The knocker may be made from $\frac{3}{8}$" to $1\frac{1}{4}$" square stock as desired. The first step is shown in Fig. 1. Draw out one end as shown in Fig. 1 and again as in Fig. 2. The extended part is to be used for the tongue. Split the mouth open on each side of the tongue while the metal is hot, being careful to have the tongue of uniform thickness. Do this with a thin chisel having the piece in the vise when cutting to the form of Fig. 3. Fuller back of the head and draw the piece as shown in Fig. 4. If ears are desired split them with the chisel from the back of the head and bend them up as shown in Figs. 5 and 6. Finish the bottom of the knocker in any way desired. When the whole piece is forged to the desired form grind off all parts that are too large and anneal the piece. The piece is then put in the vise and the eyes are chiseled after which the balance of the head is finished with files and chisels in any manner desired. In cutting the head, one should have diamond pointed, narrow flat and round nosed chisels. These chisels are made from $\frac{3}{8}$" hexagonal tool steel and ground with short angles. The secret of chiseling is to have the tools sharp. They must have perfectly flat angles and not rounded. Any cutting tool must have flat angles to do good work. In order to test the chisels for sharpness press the cutting edge slanting against the thumb nail. If the tool slips it is not sufficiently keen. A flat running, fine emery wheel is best for grinding.

Fig. 7 shows the form of a diamond point chisel. Notice at the bottom it is ground to a sharp angle. This is called *setting the chisel up* so that grooves can be cut with it.

MAPPING HOME PROJECTS.

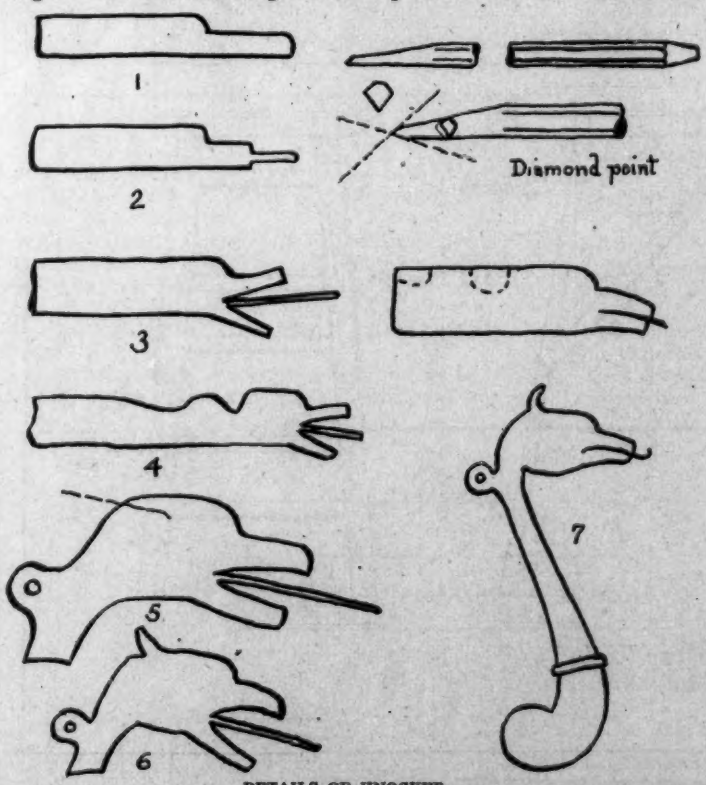
J. Q. Adams, Instructor in McMinnville, Agricultural Department.

In order to have the location of each student's home project visualized and conveniently at hand, and to most efficiently and systematically arrange trips for their supervision, the following plan is suggested:

A map or blueprint sufficiently large and in detail enough to show the location of each home project, road, and other important landmark is used. A convenient size is about 18 to 20 inches square with a scale of 1 inch to the mile. The map is mounted on thick cardboard or beaverboard to make it stiff and allow pins to be stuck into it.

A numbered, typewritten list of the students having projects is prepared and posted near the margin or some convenient place on the map.

Pins are stuck in the map at each point where there is a project, pinning down small square pieces of stiff white paper, each with a number corresponding to the number found on the numbered list which was pasted to the map. By this means each pin placed on the map has a number and by referring to the numbered list each can be identified as a certain student's project.



DETAILS OF KNOCKER.

A KNOCKER FORGED BY MR. GOOGERTY.

THE GATE IN PLACE.

HEDGE GATE.

C. F. Wintersteen, Homestead, Pa.

The gate shown in the drawing was not made in a school shop but with a few common woodworking tools on an improvised bench at home.

A hankering to whittle some virgin white pine, a back to the garden and village spirit, together with a desire to improve an unkempt front yard prompted the artisan, a mechanical drawing teacher, to modify an old New England gate design for his own use.

While the gate is light in weight, it is extremely strong. It makes a delightful entrance and fills a real need.

The framework is all mortise-and-tenon construction. The lattices have to be fitted, each piece separately, and nailed.

For the gate posts, locust, chestnut, cypress, cedar or any wood that resists dampness and moisture can be used. They should be planted at least two and one-half feet deep to be below the frost line, after which they are boxed as shown. It will be necessary to exercise some care in spacing them so the gate will fit.

The drawing and brief description are submitted only as a treatment of an individual condition.

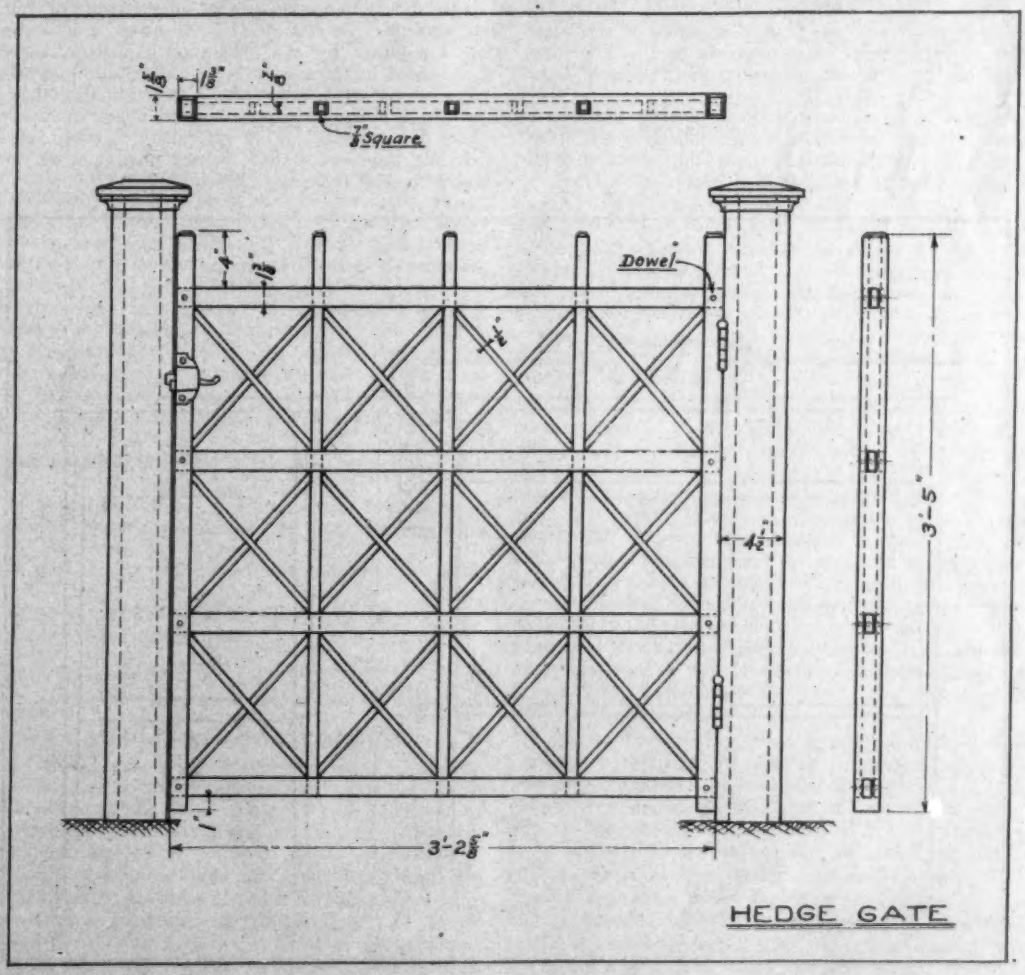
A SQUARED BLACKBOARD.

William V. Winslow, Industrial Department,
North Tonawanda, N. Y.

A shop blackboard is most serviceable when divided into squares. These squares can be made of convenient size by stepping off two inch spaces with dividers and connecting opposite points at the top and bottom and at the two sides, respectively, of the blackboard. Boards are often divided in this way in engineering schools; they are of equal advantage in secondary schools.

The scratch awl is used against a straight edge upon the surface of slate boards. The fine line left by the awl gives the instructor opportunity to observe line direction and scale while sketching drawings in a class demonstration. These scratched lines do not interefere with writing or drawings displayed in crayon upon the surface of the board for it will be found that the lines forming the squares are scarcely visible half way across the room.

Occasionally the student will find it to his advantage



DETAILS OF HEDGE GATE.

to use the board in working out a design for a piece of construction too large for full size on his drawing board.

Furniture drawing, as is the practice in the industry, should be done full size. Such drawing can be readily worked out by the student on the blackboard and will serve in a general way the purpose of a rod.

Enlarging on a Squared Blackboard.

Teachers of art are familiar with the process of enlarging by means of squares. A picture or diagram to be enlarged is divided into squares, then larger squares are made and the lines of the picture or diagram are drawn into the larger squares as they appear in the smaller ones.

It is proposed to do away w th marking squares on the original picture or diagram by tracing quarter inch squares on the surface of transparent celluloid. The celluloid thus prepared is placed over the original and a copy is then made onto the squared blackboard. Of course the celluloid can be used indefinitely; the original is not defaced.

Grade teachers will find a piece of squared celluloid a convenience in making seasonal blackboard drawings from small originals. There are books obtainable giving pictures already divided into squares for enlarging but with celluloid thus prepared any picture is at once available for this purpose.

To square a piece of celluloid place it over co-ordinate paper and trace the lines upon it with a knife by drawing the point along the edge of a brass bound ruler.

SIDE TABLE.

P. H. Heron, Head of Technical Dept., San Diego High School.

The side table was the first of a series of problems that take in commercial shop methods and was a forerunner for the construction of twenty-five teachers' desks made for the grade schools.

Twenty of these tables were made during the month of October with the intention of the school to sell them to the public at our exhibit in January but most of them were purchased by the makers.

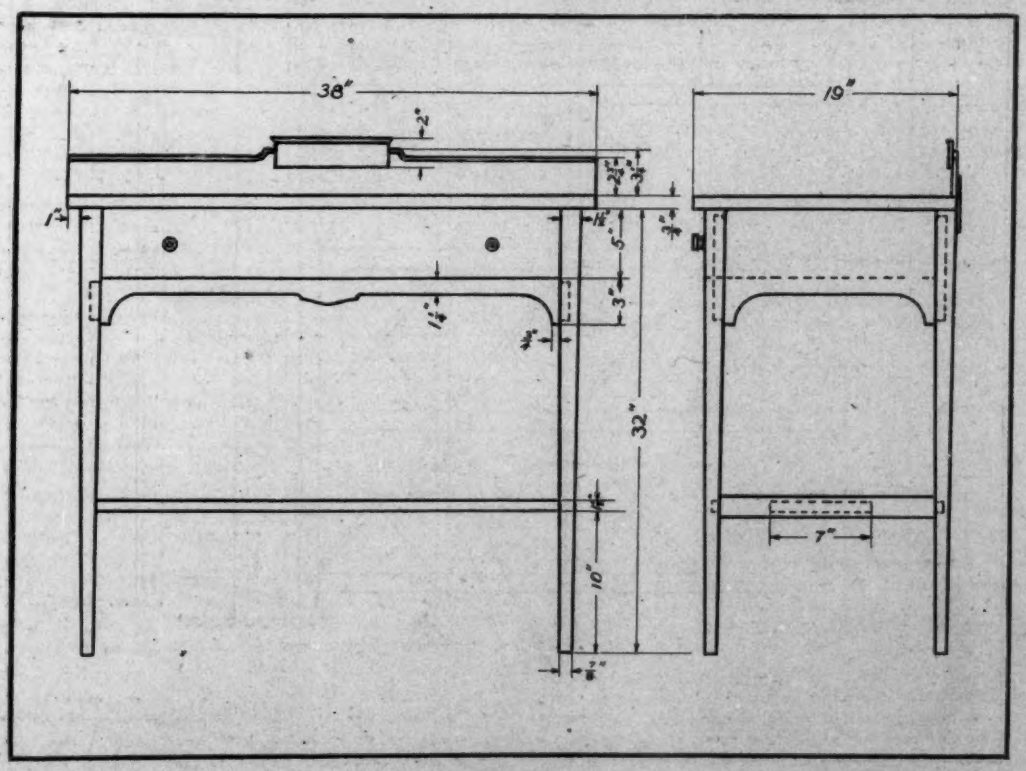
THE TABLE AS MADE BY THE AUTHOR'S CLASS.

The side table shown in the photograph was constructed of gum. Some of the others were constucted of mahogany and given a varnish finish.

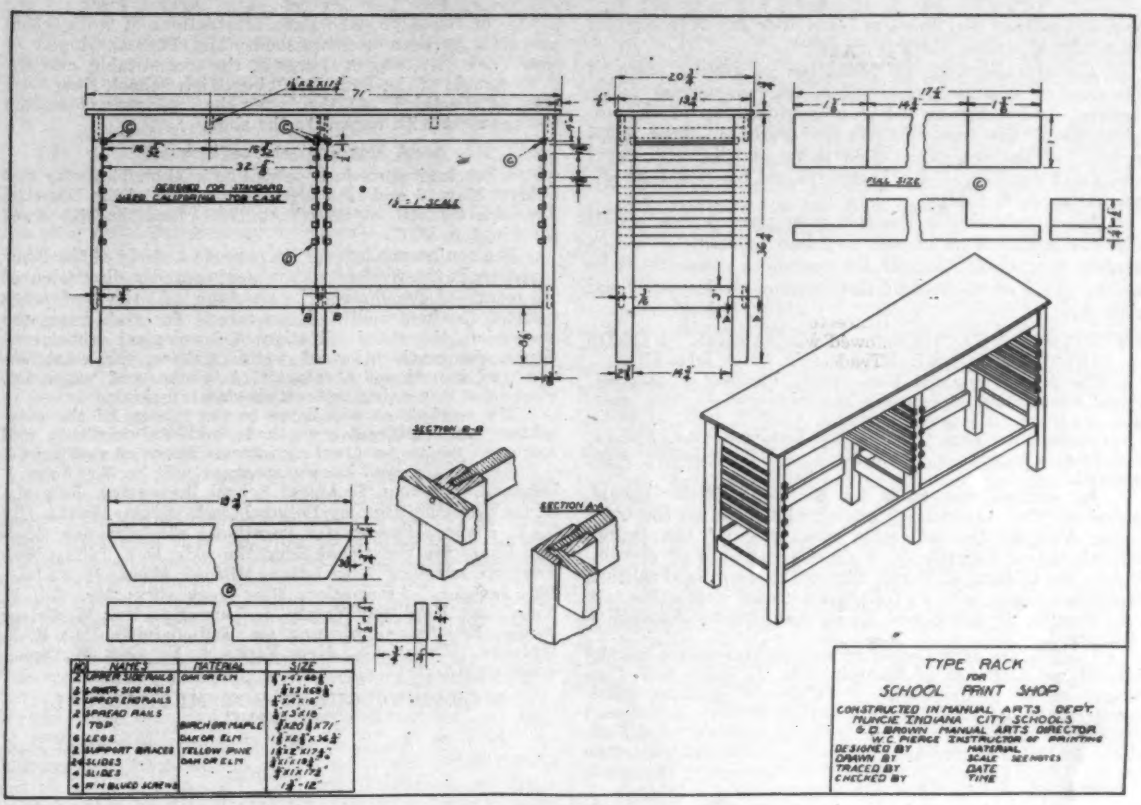
SPECIAL TYPE-RACK FOR HIGH SCHOOL PRINTSHOP.

Glen D. Brown, Director of Industrial Arts, Muncie, Indiana, City Schools.

In the wide-awake modern department of industrial arts equipped for practical instruction, the writer feels that a medium for the presentation of the highest type of practical instruction will be unfortunately disregarded unless advantage is taken of the opportunity that is offered for school shops to supply special needs of the various school departments. This statement is made, of course, with the implication that school project work for mercenary reasons only is to be condemned.



DETAILS OF SIDE TABLE.



DETAILS OF TYPE RACK FOR SCHOOL PRINT SHOPS.

Not only have many helpful problems been designed and constructed by the students of our local high school, but several innovations in special school furniture have been quite successfully designed and constructed which met a real need and supplied a means for very thoro training in drafting, mill and cabinet work.

The accompanying drawing is a special type rack designed and constructed in the industrial arts department for the print shop. The idea was that of our instructor in printing who came to us with 30 years of practical experience. For school use this type rack proved to have the following advantages over the standard type rack:

1. Its height permits the student to work more efficiently.
2. It saves floor space and it permits four boys to rack instead of two. It also provides three cases to each boy.
3. It provides an individual working bank for each boy.
4. It permits better lighting facilities.
5. The original cost is less.

NOTE: We found it expedient to purchase the regular standard California job case for these racks instead of constructing them in our shops. However, they could be used as a practical school problem.

THE LOGANSPORT CONFERENCE.

One of the objects of the conference was to bring to the attention of all of the vocational teachers the general educational value of the boys' and girls' club work—especially in developing initiative and organizing ability on the part of the pupils.

Discussion was encouraged and interesting methods of adopting valuable features of the club and project idea to the vocational program were suggested. In home economics plans whereby girls might have complete charge of planning and serving meals for small home parties were discussed.

In the industrial field the plan of getting blue prints and specifications and material from commercial establishments was recommended. It was agreed that there was some danger because the students might spoil a large percentage of material, and also that the instructor might in his zeal to show production forget that in this case the finished product must be secondary to instructional purposes. The use of jigs was attacked and successfully defended on the grounds that the idea of wholesale production was an exceedingly valuable one to impart.

The distinction between courses of study and methods with a group of vocational pupils and a similar group who were being taught for general educational purposes was thoroly discussed. It was pointed out that the aim of the general industrial group should be to broaden the experience and give a basis for later choice of an occupation while with the vocational group an occupation had already been selected and therefore the object must be to give skill in the chosen activity and information in the related technical subjects. Immediately questions arose as to methods of choosing the vocational groups. One successful director suggested careful selection on the basis of interest and aptitudes, and a simple written contract signed by the director, the parent and the pupil. He also suggested a probationary semester.

In view of the high cost of equipment and with the hope of dovetailing school and industrial experience, it was agreed that the closest possible contacts with industry should be established. The plan of working on production jobs in the school was considered to be only the first step to be followed by a rotation plan in which two pupils are paired, one being in industry and one in school. The discussion brought out the fact that in Indiana we already have a hopeful flexibility of organization. For example, pupils are working in industry and being excused to spend ten hours a week in a school drafting room. Also, in certain railroad centers where there are 8 hour shifts, young

men are getting two hours of school per day before going on to the afternoon shifts.

The discussion of the possibility of getting more of the shop or laboratory activity in the commercial or industrial field naturally led to a consideration of the importance of the related subjects. Perhaps, there is no portion of the vocational field more in need of careful study and more in need of better trained teachers than the related subjects field.

As a problem for the following year it was agreed that mathematics or science as related subjects would be studied intensively thruout the year by a committee who would also agree to present their courses to the vocational groups. —*H. G. McComb.*

PRINTING TEACHERS' ASSOCIATION HOLDS FIRST REGIONAL MEETING AND DINNER.

The New York and New Jersey Chapter of the National Association of Printing Teachers held its first meeting and dinner Saturday evening, April 9, 1921, at Hotel Gonfarone, New York City. About forty teachers of printing from all parts of New York and New Jersey were present.

An address was made by Mr. John Clyde Oswald, editor of "The American Printer," who spoke on the work being done by the education committee of the United Typothetae of America, and also on the need of apprentices. Mr. Clifford E. Parsil, director of vocational schools, Middlesex County, N. J., followed with an instructive talk on "Teacher Training and Trade Analysis as Applied to Printing."

The feature of the evening was an illustrative talk by Mr. Frank A. Baker of Montclair, N. J., High School on "Linoleum Block Printing." Portfolios of printing specimens completed in a school print shop were distributed among the members. To conclude the meeting a brief address on the plan and aims of the organization was given by Mr. David Daniels, Newark, N. J., temporary chairman.

The officers elected to serve the ensuing year are: J. E. Mansfield, New York, president; H. Burns, Newark, N. J., vice-president; A. H. Mathieson, Brooklyn, N. Y., treasurer; D. Daniels, Newark, N. J., secretary. The next meeting will take place in June.—David Daniels.

New York Shop Teachers' Dinner.

At the dinner of the New York Associated Teachers of Shopwork, held at the Hotel Pennsylvania on April 16th, facts were presented showing how urgently legislation is needed to protect school financing. President Timothy Poucher and R. G. Weyh, Jr., toastmaster, declared that this association could be counted upon in the campaign for financial independence for boards of education in cities of the state.

Superintendent Mondel told of the developments at Albany and the certainty that next year legislation affecting the organization and administration of the schools will be passed. He pointed out that education is the weakest of all functions and needs the greatest legislative protection. He referred to many of the unfortunate results of dual control and made a forceful plea for united action.

Further facts showing the unfortunate financial situation in the schools were presented by T. W. Metcalfe, who showed how it will be necessary in 1922 to meet a larger deficit than in 1921 by a bond issue. He reviewed the state-wide campaign and urged the shop teachers to join in it.

Mr. Samuel Stern of the board of education paid a tribute to the work of the shop teachers commending highly the courses conducted and the exhibit of work on display.

The exhibit was also commended by Associate Supt. Gustav Straubenmuller. who delivered an address, stressing the importance of the "will to do." He illustrated his points with stories and predicted that in time the shop teacher will be an influence thru the schools, instead of upon only the older pupils who now come under their instruction.

SCHOOL CRAFTS CLUB MEETING.

The April round-table meeting of the School Crafts Club was held April 23rd, at the Murray Hill Vocational School, New York City.

At the meeting, the sessions were divided into three divisions, embracing art metal work, woodcraft, and the forum. The first round table was in charge of Mrs. Annie C. Coe of Brooklyn, who gave illustrations of work which has actually been accomplished. Mr. Thomas Hogan of New York City, was in charge of the second table, and Mr. F. C. Arnold of the Evander Childs High School, New York City, of the third. At the latter the topic was classroom management with regard to the shop.

A Horological Conference.

A horological conference will be held on Thursday and Friday, May 19 and 20, under the auspices of the National Research Council, at its offices 1701 Massachusetts Ave., Washington, D. C.

The conference has for its purpose a study of the labor situation in the field of watch making and a discussion of the means of overcoming the shortage. At the conference various speakers will talk on means for stabilizing the profession, the standardization of horological school curricula, the certification of watch makers, the establishment of a national horological institute, and ways and means for increasing interest in watch making.

The conference will listen to the reports of the committees on certificating methods, national institute and ways and means for creating interest in watch making.

Among the well-known speakers will be Mr. John J. Bowman, Bowman Technical School, Lancaster, Pa.; Mr. A. G. Westlake, Bradley Polytechnic Institute, Peoria, Ill.; R. T. Fisher, director for vocational rehabilitation, Federal Board for Vocational Education; Mr. E. F. Lilley, New England Jewelers' Association, Milford, Mass.; R. F. Nattan, Jewelers' Association, New York City; Mr. Tell B. Nussbaum, Hamilton Watch Co., Lancaster, Pa.; W. Calver Moore, Keystone Publishing Co., Philadelphia, Pa.; F. T. Haschka, Tiffany Co., New York, N. Y.; Geo. W. Spier, Washington, D. C.

A GRADING CHART FOR MECHANICAL DRAWING.

Mr. P. M. Spink, director of manual training at Faribault, Minn., has recently put on the market a grading chart for mechanical drawing. The chart is based on the same general principles that have been used in the formulation of the well known Ayres writing chart and has been evolved from an examination of plates of a large number of pupils in mechanical drawing in the seventh and eighth grades and in the high school.

The plates contain the single practice line, "The slow fox jumped quickly over the lazy brown dog" and represent the same in one-quarter and three-eighths inch lettering with Roman and Italic letters. At the bottom of each plate there are numerals, typical solid and dotted lines, curved figures and dimension lines. The several plates are evaluated on the basis of one hundred for the grades and for the high school. The work of the students can be readily rated by simply comparing it with the plate which it most nearly resembles in quality.

The plates are intended to establish a definite value for successful work and to remove the subjective elements of rating.

SPECIMENS OF PRINTING.

The Industrial Arts Magazine is in receipt of a portfolio of most interesting printing specimens sent by Mr. David Daniels, Instructor in Printing at the West Side School, Newark, N. J. The portfolio contains only specimens of work done by students in the eighth grade. The West Side School is an elementary school and its shop work is entirely limited to the elementary grade work.

The most impressive bit of work included is a sixteen-page booklet of illustrated nursery rhymes designed, set in type and printed entirely by the boys. The booklet cover and six full pages are illustrated with linoleum blocks designed and cut by the boys and colored with water color paints. The plates show considerable originality and good taste.

Among the useful examples of work is a series of four-page circulars used to correlate the printing with the academic work of the school. The circulars include such topics as the abbreviations of the states, list of common homonyms and antonyms, list of roman numerals, common abbreviations for the seventh grade.

Other circulars include poems, editorials and brief articles of value.

One of the useful productions of the school is a calendar, each leaf of which includes in addition to the calendar for the month an appropriate poem or prose quotation selected by a student and set in type and printed.

NOW, ARE THERE ANY QUESTIONS?

This department is intended for subscribers who have problems which trouble them. The editors will reply to questions, which they feel they can answer, and to other questions they will obtain replies from competent authorities. Letters must invariably be signed with full name of inquirer. All questions are numbered in the order of their receipt. If an answer is desired by mail, a stamped envelope should be enclosed. The privilege of printing any reply is reserved. Address, Industrial-Arts Magazine, Milwaukee, Wis.

Weaving on a Hand Loom.

183. Q:—Two of my students are building a little hand loom, for making neckties from an article by Louis J. Haas, in your November, 1918, issue of the Magazine. Where can I get instructions as to best material and an idea of how the patterns are woven in.—C. H. S.

A:—The article "Equipment for the Bedside Occupation of Men" explains clearly just how to warp or thread up the necktie loom. It also explains how to narrow the weaving to form the neck of the tie, and how to widen it out again to form the tail of the tie. The method of producing a selvedge across the tail end of the woven tie is explained. The method of threading up the loom allows the weaving to start with a selvedge across the front end of the tie. This end of the completed tie can be released from the warp link by simply cutting the chain stitch which connects it with the link.

To start weaving with this loom, the initial shed is opened by placing the reed or beater in the upper notches. Pass the shuttle thru the shed, take the end of the woof thread around the first warp thread and pass it in again thru the same shed about one-half an inch. Release the reed or beater from the upper notches and pull all the way forward packing the woof thread firmly home between the warp threads. Reverse the shed by placing the beater now in the lower notches. Pass the shuttle with the woof thread back thru the shed, and then beat in place as before. Plain weaving consists of just the orderly repetition of the above. A good selvedge is gained by just pulling the woof threads all the way thru but not the least taut before beating home. Practice shows that if the woof thread is placed in a diagonal position across thru the shed before beating it home, this eliminates the tendency of the selvedge to become tucked in and keeps the weaving full width.

The following may give just a brief insight into the method of weaving patterns upon the necktie loom. First I would suggest that the beginner thread his loom with a three-ply hard twist (natural color) mercerized cotton warp thread. This makes a very strong warp which will behave well in inexperienced hands. Use the same for the woof thread which is wound upon the shuttle. Have a second wound with a four or six-ply soft twist, natural mercerized cotton thread for the pattern. The pattern thread may be left natural in color or dyed, with diamond or rainbow or some such dye, by following the directions contained on the package of dye. The thread may be procured from any wholesale dealer in yarns for weaving purposes, altho small quantities can be perhaps more easily obtained in the department stores. Start the tie by weaving ¼ inch of plain with the three-ply woof thread. Weave the last plain woof thread with the shed opened by placing the beater in the upper notches. Now start the pattern thread thus: bring the beater out of the notches and let it hang neutral, and begin counting off the pattern with the point of the pattern shuttle. First pass over two warp and under the next two threads, following this order all the way across the warp. Pull the thread thru, then take the end of the pattern thread around the first warp thread, and in and over and under the same threads for one-half inch and then beat home. Now place the beater in the lower notches and then pass a single woof thread thru this shed and beat home. Bring the reed or beater to neutral again and count back with the point of the pattern shuttle, the pattern combination going over and under the very same group of warp threads. Pull this pattern thread thru, beat home, place beater now in upper notches, put in single thread and beat home. Continue this sequence of pattern thread, woof thread, taking care to alternate the sheds for the woof threads in the exact order described. Following the above will give us a pattern a number of narrow stripes running with the length of the belt or tie. By advancing the count of two over and two under just one warp thread each time a pattern thread is put in produces diagonal stripes. Quite different effects can be produced by experimenting with different counts such as two over and six under, or three over and three under, also by combining these. Thus the first pattern thread might be one group of counts, the second pattern thread another, and the third pattern thread still another and the fourth would start repeating the first combination. Patterns may also be grouped between spaces of plain weaving. Setting up the loom with some of the warp threads in color also offers a series of decorative possibilities.

When ready to narrow the tie, end the pattern thread just as you started it and cut it off. The neck of the tie is woven only with the three-ply woof thread. The tail of the tie may be completed with the plain weaving or the pattern may be introduced again as soon as the widening of the tail of the tie has been completed. The widening and narrowing process is fully explained in the article mentioned above. Belts should start with the weaving four inches from the warp link; when completed, the warp at each end is tied into tassels. The pattern usually continues thruout the length of the belt. After experience has been gained suitable silk thread may be used.—Louis J. Haas.

Boat Building.

191. Q:—Will you kindly advise me where I may secure good blue prints for a flat-bottom boat?—E. A. F.

A:—You will find exactly what you want in Stephens' "Boat Building Plates," published by Forest & Stream Publishing Co., New York City. You can also find some simple boats in Hall's "The Boy Craftsman," published by Lothrop, Lee & Shepard, and in Miller's "Canoeing and Sailing," publishing by Geo. H. Doran Co., New York City.

Treatment of Sticky Leather.

192. Q:—Have a leather chair and in warm weather I am troubled with cloth sticking to it. Could you give me any information to remedy the trouble?—H. R. D.

A:—Sticky leather may be readily treated by the following method:

Wash the seat and the back thoroly and let them dry. Then give them two thin coats of shellac. A lacquer may be used in place of the shellac, if available. The shellac should be cut with alcohol as a reducer and should be brushed on as thinly as possible.

Tarnish Prevention on Brass.

193. Q:—Can you give me some method of treating brass so that it will not tarnish? I have a number of brass articles that I have made and I understand that there is some way of treating the surface to keep it from tarnishing.—J. K.

A:—Brass articles may be kept from tarnishing by giving them a coat of metal lacquer or a coat of shellac to which camphor has been added. A good formula is the following:

Dissolve one ounce of best brown shellac in one pint of alcohol (wood alcohol will answer and is much cheaper), and add to such solution 1 dr. of gamboge and 3 dr. of cape aloes. Heat the articles and apply the lacquer with a camel's hair brush. The articles should be thoroly cleaned and polished before the lacquer is applied, otherwise the result will be disappointing.

Refinishing a Table Top.

194. Q:—I am refinishing a table top of oak which has apparently been filled with a silex wood filler. The top was deeply scratched and must be rescraped and resandpapered. Could you suggest a way of taking out the scratch?

Can you give me the name of a book or any other material on furniture refinishing?—L. E. H.

A:—Table tops, or other surfaces undergoing a refinish and which must be resurfaced to the new wood, may have the silex filler softened up, if a liquid varnish remover is brushed on and allowed to remain long enough to soften the filler, presuming of course that the old varnish has been removed to this point. A steel brush of the short bristle type, such as is used by painters in cleaning off siding and other outside work, may then be used as a picking brush to remove the filler.

This is accomplished by brushing carefully with the grain using a short, choppy stroke in which the brush is quickly forced down into the work and lifted up away from the surface at the end of the stroke in such a manner as

to enable the bristle to flick out the filler with which it comes in contact. After this operation is complete and the wood is still soft from the varnish remover, little or no difficulty should be experienced in scraping to a new surface provided, however, that the scraper be sharpened to a long, thin bevel edge in preference to the usual method of turning the short square edge. Sometimes after picking with the steel brush, the use of a little benzine swabbed on with a rag just ahead of the scraper blade will enable the scraper to take hold when nothing else seems to do the work.

For material on refinishing furniture, consult back numbers of the Industrial-Arts Magazine for Apr., 1919, p. 160; Jan., 1917, p. 44; Mar., 1917, p. 132; Nov., 1919, p. 469; June, 1917, p. 262. Kelly's "Expert Wood Finisher," published by the author, at Malvern, Pa., is a good text for this work—Ralph G. Waring.

Mechanical Drawing Problems.

198. Q:—In a mechanical drawing, side view, of a bolt and nut with the end of the bolt just partly thru the nut, in what direction would you show the lines representing the threads of the nut that are not in contact with the bolt? Assume the bolt and nut with standard right hand thread.

In drawing an isometric of a figure, such as a sphere surrounded by a flange, how do I draw the sphere isometrically? The flange is simple enough, but how about the sphere?—H. N. A.

A:—Some firms have abandoned entirely showing threads by slant lines and use lines at right angles to the edge of the bolt. In any case the thread in the upper half of the nut slants the same direction as on the bolt and should be shown thus. If the nut is shown in section then the thread on the lower half of the nut would be seen and the nut thread would appear as a left-hand thread.

A sphere is shown as a circle in isometric drawing, while the flange will be an ellipse cutting the sphere. Refer to Isometric Drawing by A. P. Jamison (John Wiley & Sons) in which will be found a number of cases showing spheres.—Geo. Ellison.

NEW BOOKS

Problems in Elementary Woodworking.

By Hugo J. P. Vitz. Cloth, 8½x6½, 126 pages. The Southern Publishing Co., Dallas, Tex.

This book presents two years of work for introductory woodworking classes and assumes that instruction will be given by the group method. In part one, the class is introduced to simple one-piece problems and butt joint construction, with nail and screw fastenings. The projects are grouped according to the nature of the structure and each group includes photographs of ten to fifteen models, working drawings, and simple suggestions. Students are expected to choose one model from each group. This feature of the book allows for personal likes and needs of boys and recognizes individual capacity.

The second half of the book follows the same plan and carries the work along in the making of simple articles of furniture, home utilities and toys. The careful grading of objects in the first half of the book is continued. The pieces involve dado and face cross-lap joints, edge cross-lap and dowel edge joints, and dowel butt joints.

It is interesting to note that the author has not entirely abandoned the old-time "exercise," but uses a single piece as a means of introducing each year's work. He recognizes the desirability of original design and supplies several sheets of cross-sectioned paper, following each group, for pencil sketches.

Elementary Home Economics.

By Mary Lockwood Matthews. Cloth, 12mo, 343 pages. Little, Brown & Co., Boston.

Sewing and textiles, foods and cookery, and the care of the house are included in this well-balanced text. The work is developed on the project basis so that the purely informational material, the laboratory exercises, the home problems and the questions all have a central basis of interest and application. The section on sewing offers six general projects; work in cooking is divided into "meals" and care of the house suggests a daily, weekly and seasonal "schedule" of tasks.

The book is simple in style and well within the abilities of seventh and eighth grade girls. The treatment is entirely free from the tendency to emphasize over-strongly the art, or health, or economic aspects of the subject.

Stenciling.

By Adelaide Mickel. Paper, crown octavo, 62 pages. Manual Arts Press, Peoria, Ill.

This is a simple handbook presenting the elements of the art of stenciling in form for use by art and domestic-science teachers. It begins with detailed descriptions of the materials, tools and equipment and of the several processes. The most valuable section is a series of graded projects for the elementary and high schools. The book is entirely practical; the designs are appropriate and simple enough for children; the illustrations are complete.

Gasoline Automobiles.

By James A. Moyer. Cloth, octavo, 261 pages. McGraw-Hill Book Co., New York, N. Y.

The gasoline automobile has been developed on certain principles that must be understood by the driver to obtain even the most ordinary results. Again, the problem of troubles and cost of operation are relieved by at least the appreciation of causes and effects.

This book, entitled "Gasoline Automobiles," pretends to be just a statement of principles or causes and effects. It is simple, comprehensive and not too technical for the "man who owns one."

The Manufacture of Pulp and Paper.

By J. J. Clark. Cloth, 6x9, 441 pages, fully illustrated. McGraw-Hill Book Co., Publishers, New York, N. Y.

This book is the first of a series of five volumes prepared under the direction of the Joint Executive Committee of the Vocational Education Committees of the Pulp and Paper Industry of the United States and Canada. The series is to take up in detail the mathematics of the industry, mechanical drawing, physics, mechanics and hydraulics, electricity and chemistry, the preparation of pulp and the manufacture of paper.

The present book is limited to arithmetic, applied mathematics, the reading of mechanical drawings, and the elements of physics. The book is written in that clear and complete style that is necessary for correspondence instruction. It simply states definitions and principles and explains these completely. Only a very limited number of examples is added to each section to illustrate the principles discussed.

The section on mathematics includes the elements of algebra and geometry and advances into trigonometry far enough to explain the mensuration of solids.

The section on blueprint reading is of the briefest kind but is ample to give the student a sufficient understanding of the subject to read simple drawings of paper-making machines.

The section on physics includes matter, motion and force, hydrostatics and pneumatics, heat and light. The treatment is of the practical applied type and takes illustrations from everyday life and industry.

Handbook of Tailoring.

By Franz F. Deiner. Cloth, 152 pages, illustrated. Published by H. B. Niver for F. F. Deiner & Co., 417 Fifth Ave., New York, N. Y.

This book outlines the sectional system of organizing a tailor shop. It divides the making of a coat into 74 operations, and analyzes each on the basis of processes, time, etc. The apportionment of operations in sections is described for shops of various sizes, so that the most advantageous combinations can be made in shops employing as few as fourteen workers and as many as 150 workers. The book is concise and to the point and avoids all theoretic discussions and suggestions. Two final chapters describe methods of making alterations and of keeping shop records.

Some Exercises in Farm Handicraft for Rural Schools. H. O. Sampson. Bulletin 527, 1917, U. S. Department of Agriculture. This bulletin offers instruction in the making of useful articles for the school, farm and home. It is primarily intended for rural school teachers and for pupils of the seventh and eighth grades and the exercises have practical application to the agricultural work of the school and to the various club projects in agriculture.

The Care of Leather. By F. P. Veitch, H. P. Holman and R. W. Frey. A contribution from the Bureau of chemistry. Farmers' Bulletin 1183, December, 1920, U. S. Department of Agriculture, Washington, D. C. The bulletin contains suggestions for a judicious selection of articles made from leather and tells how to care for them in order to obtain maximum service. The pamphlet discusses in detail, selection, care, and preservation of leather in shoes, harness, belting and book and bag leather.